

Niagara Falls

POWER



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Niagara Falls Power *§ § §*

Its application
and use on the
Niagara Frontier

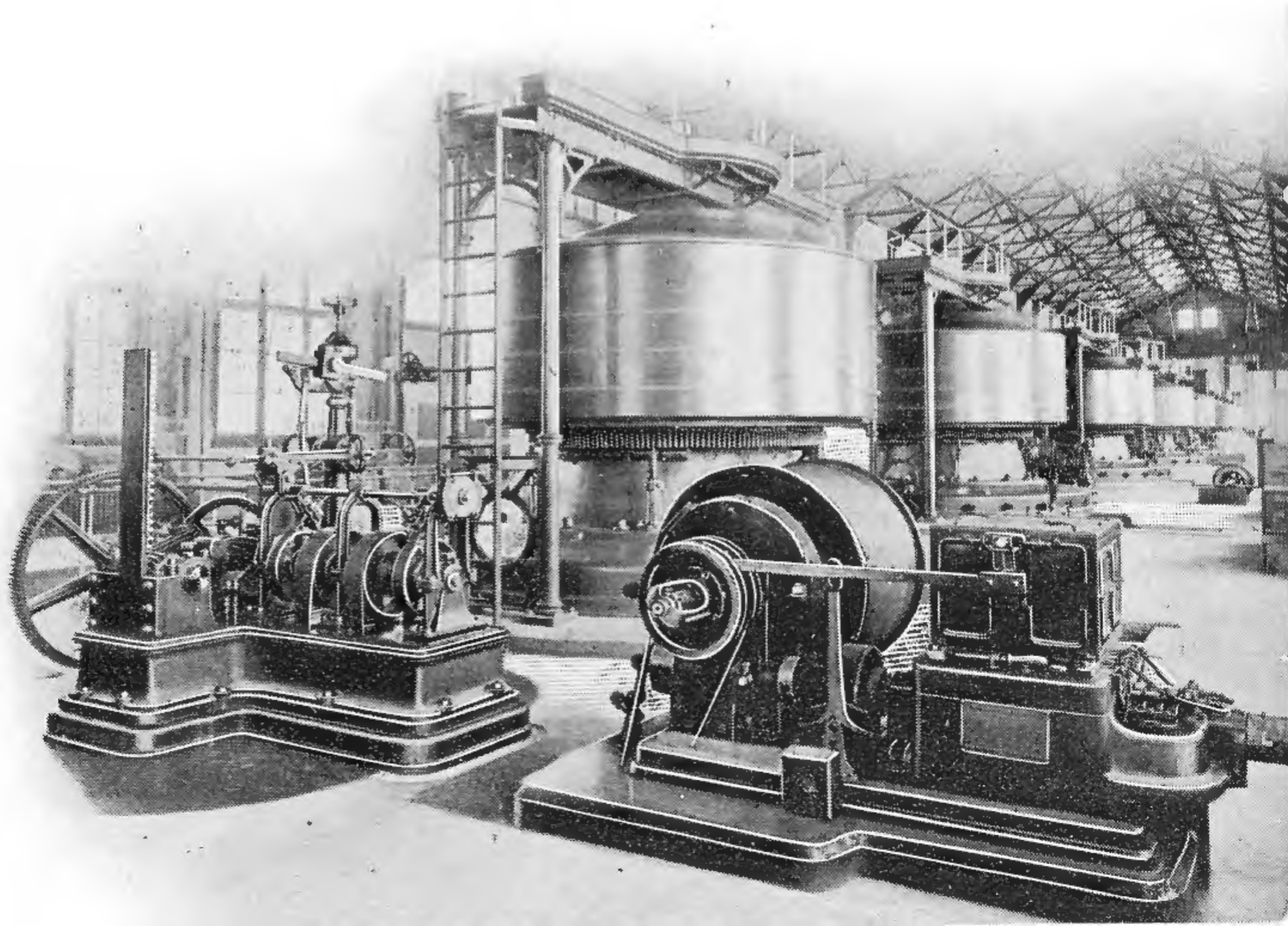
1901

Niagara Falls *✧* Buffalo
Lockport *✧* Tonawanda

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The Niagara Falls Power Company ∅ ∅ Uses of its Power

THE work of "harnessing Niagara"—one of the notable achievements of engineering skill of the last decade—is now an accomplished fact. In a district reaching from St. Catharines, Canada, on the west, to Lockport, New York, on the east, and extending through the Tonawandas to Buffalo, with its suburban surroundings on the south, substantially every municipal electric light, every street car motor and trolley in use is now supplied with energy developed from the Falls of the Niagara River by The Niagara Falls Power Company. In the City of Niagara Falls, 8,000 H. P. of this Company's hydraulic power, and about 30,000 H. P. of its electrical current is used for manufacturing purposes, and the small village of ten years ago has grown into a great manufacturing city and is now recognized as the home of the world's largest and most important uses of electricity for electrolytic and electro-chemical manufactures.





Transmission lines carry without the city about 15,000 E. H. P. of the Company's present output of 45,000 E. H. P.

The immense body of water flowing through the chain of Great Lakes is substantially uniform at every season of the year. As this water flows down the Niagara River, there is a difference of about 200 feet in levels between the water $1\frac{1}{4}$ miles above and the River's surface below the Falls. On the American shore of the upper level are situated the two wheelpits and power houses of The Niagara Falls Power Company. Each of the wheelpits is substantially 180 feet in depth, 20 feet wide and 463 feet long, excavated through solid rock. Both discharge to the lower level of the River at a point a few hundred feet below the Falls through the same 21-foot tunnel, $1\frac{1}{3}$ miles in length, and extending under the city at a depth of about 200 feet. Owing to this location of the power stations all the manufacturing plants using power have been located at a considerable distance above the State Reservation, leaving unmarred by this Company's development the grandeur of the Falls and the beauty of their surroundings.

Under its charter The Niagara Falls Power Company has the right to take sufficient water from the upper River to produce 200,000 H. P. Its

completed inlet canal and tunnel now have capacity to deliver and discharge sufficient water to develop at the available head 120,000 H. P. The Company has acquired about two miles of frontage of the Niagara River above the State Reservation, with some 1,100 acres of adjoining lands, all of which are devoted to locations for industries using its power. Through these manufacturing sites there has been constructed a belt line of railroad connecting each industry, by means of a siding directly into the plant, with all the great east and west trunk railway lines running through the city.

A resident village, especially for employees and officials of tenant companies, has been built in a location easily accessible to all the lands reserved for manufacturing purposes. The village of Echota is built upon the most approved modern lines, with lawns, streets, and lights maintained without expense to tenants. Rentals are at figures easily within the reach of those for whom the homes are intended, and the Company is prepared to sell houses and lots upon favorable terms to those who wish to own their own homes.

Echota

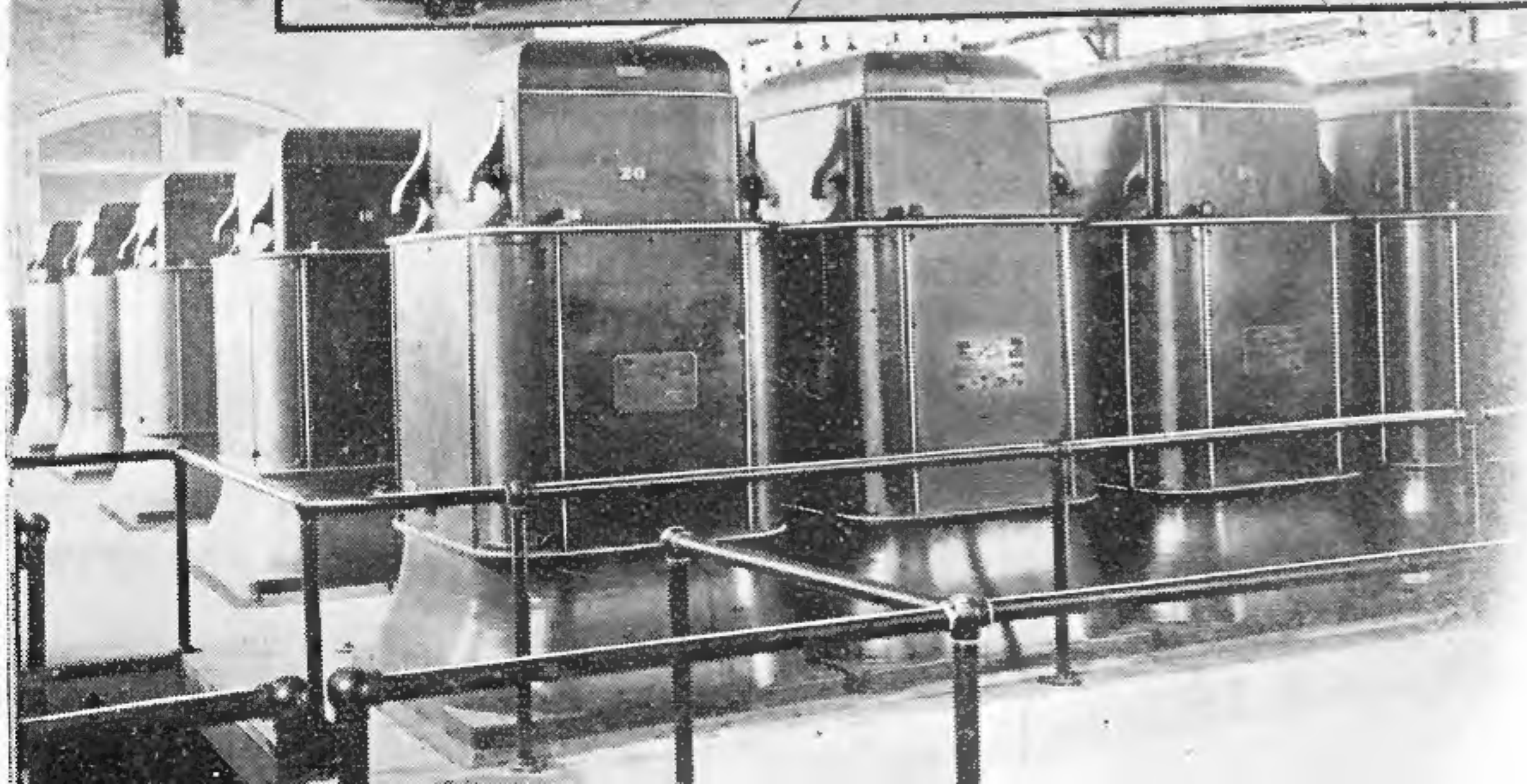
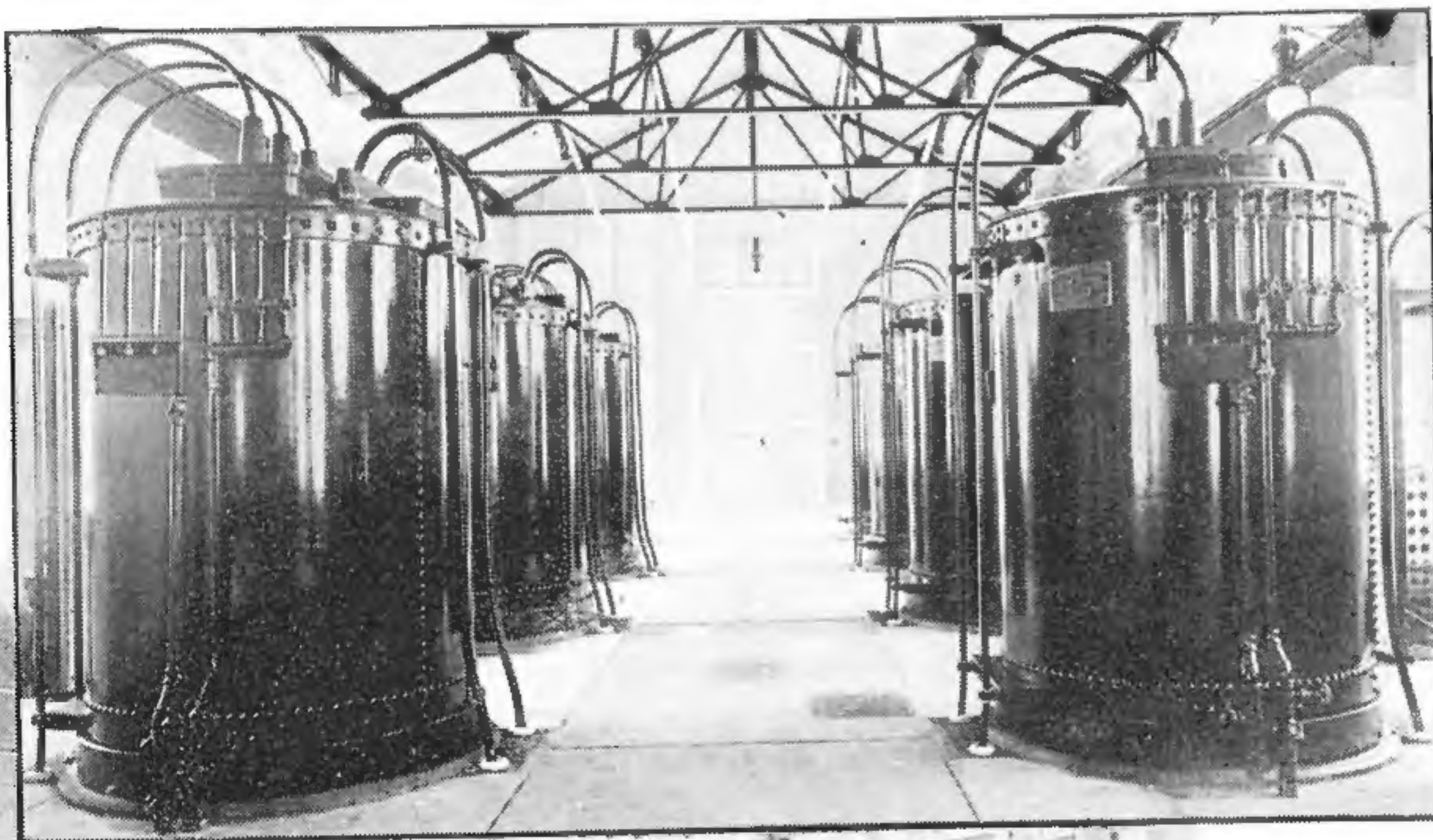
The first power station of the Company is located on the west side of the inlet canal from the river, and facing Buffalo Avenue. It is built of grey limestone and is 457 feet by 70 feet, with a wing for

Power House No. 1



offices. In this station are now installed ten dynamos of 5,000 H. P. each, generating two-phase, alternating current at a pressure of 2,200 volts, and at a frequency of 25 cycles per second. There have been installed also four smaller direct-

current dynamos, used principally for exciting currents. In order to be entirely independent one of another, each dynamo is driven by a separate turbine. All units may operate in parallel, thus affording a perfect reserve system.





Connected with Power House No. 1, by stone arches across the inlet canal, is the main transforming station. Here are located twenty 1,250 H. P. and seven 2,500 H. P. static transformers. The first are used for the purpose of transforming the current transmitted to Buffalo to three-phase current at an initial pressure of 22,000 volts; the others to transform to 11,000 volts current transmitted two miles from the power house to a sub-station on the Company's lands, where the current is stepped down for local distribution from that center.

Transformer House

A second wheelpit located on the east side of the inlet canal is now almost completed, and a tunnel extension has been made to it from the discharge tunnel of Wheelpit No. 1. Contracts have been let and the work is now far advanced for Power House No. 2, to be built over this wheelpit, and for the hydraulic and electrical installation. Such installation is substantially like that in Wheelpit and Power House No. 1, except that there will be there installed 11 units of 5,000 E. H. P. instead of 10. These two power houses will be inter-connected electrically so that any one or all of the dynamos can be applied to any particular circuit or circuits, thereby securing the utmost flexibility.

Power House No. 2

***International
Paper
Company***

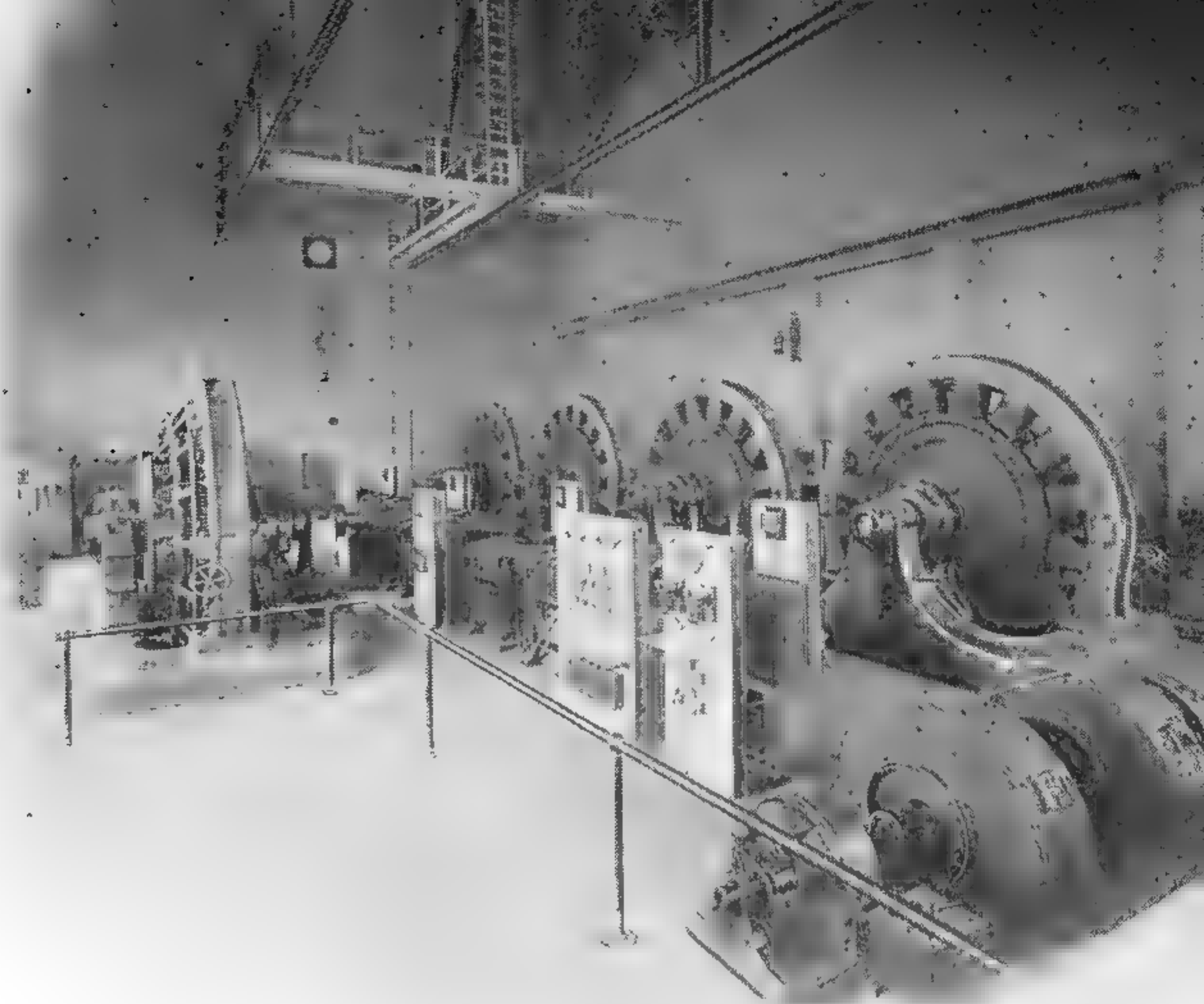
The Niagara Falls branch mill of the International Paper Company is the principal user of hydraulic power from this development. Its plant occupies 12 acres of land and its mills have a capacity of 120 tons of paper daily. Its pulp wood grinding machines are operated by power from turbines producing about 8,000 H. P. located in a separate wheelpit of its own, discharging by a branch tunnel into the main tunnel of The Niagara Falls Power Company.

***The
Niagara
Falls
Water
Works
Company***

The only other tenant of the Power Company now using hydraulic power is The Niagara Falls Water Works Company (owned and controlled by the Power Company). The Water Company filters and supplies from the Niagara River, water for domestic and municipal purposes, to all that part of the City of Niagara Falls south of Pine Street, the north boundary of the former Village of Niagara Falls. In chambers of Wheelpit No. 1 of the Power Company it has installed two 6,000,000 gallon Riedler pumps, each of which is driven by a Pelton water wheel, operating in the same chamber under a hydraulic head of 122 feet. About 60 E. H. P. also is used to operate induction motors driving centrifugal pumps for the purpose of pumping from the River into the Company's filter tanks.

***Hydraulic
Tenants***

The plan prepared by Thomas Evershed, in 1886, contemplated the location of manufacturing plants with power from separate turbines discharging into a common raceway tunnel. The fact that the two Companies last mentioned are the only tenants of the Power Company using hydraulic power direct is evidence of the greater practicability of the conversion of energy first in large units into the form of electricity.



The first tenant using electrical power to locate on the lands of the Power Company was The Pittsburgh Reduction Company, which had formerly been operating a plant at Pittsburgh, Pa., there using electrical power produced by steam-driven machinery. This Company has grown to be one of the largest users in the world of electrical power for electrolytic work. In its plant on the lands of the Power Company it is now using 5,000 E. H. P. for the production of metallic aluminum from its ore by an electrolytic process, invented by its Vice-President, Mr. Charles M. Hall.

*The
Pittsburgh
Reduction
Company*

The above picture shows the transforming machinery, consisting in the main of six large rotary converters. These machines transform the alternating current into direct current of a certain voltage, from whence it is transmitted to the furnaces in the same building. Aluminum has become one of the useful metals in many trades. A recent and important use is that of wires and cables for the transmission of electrical energy.

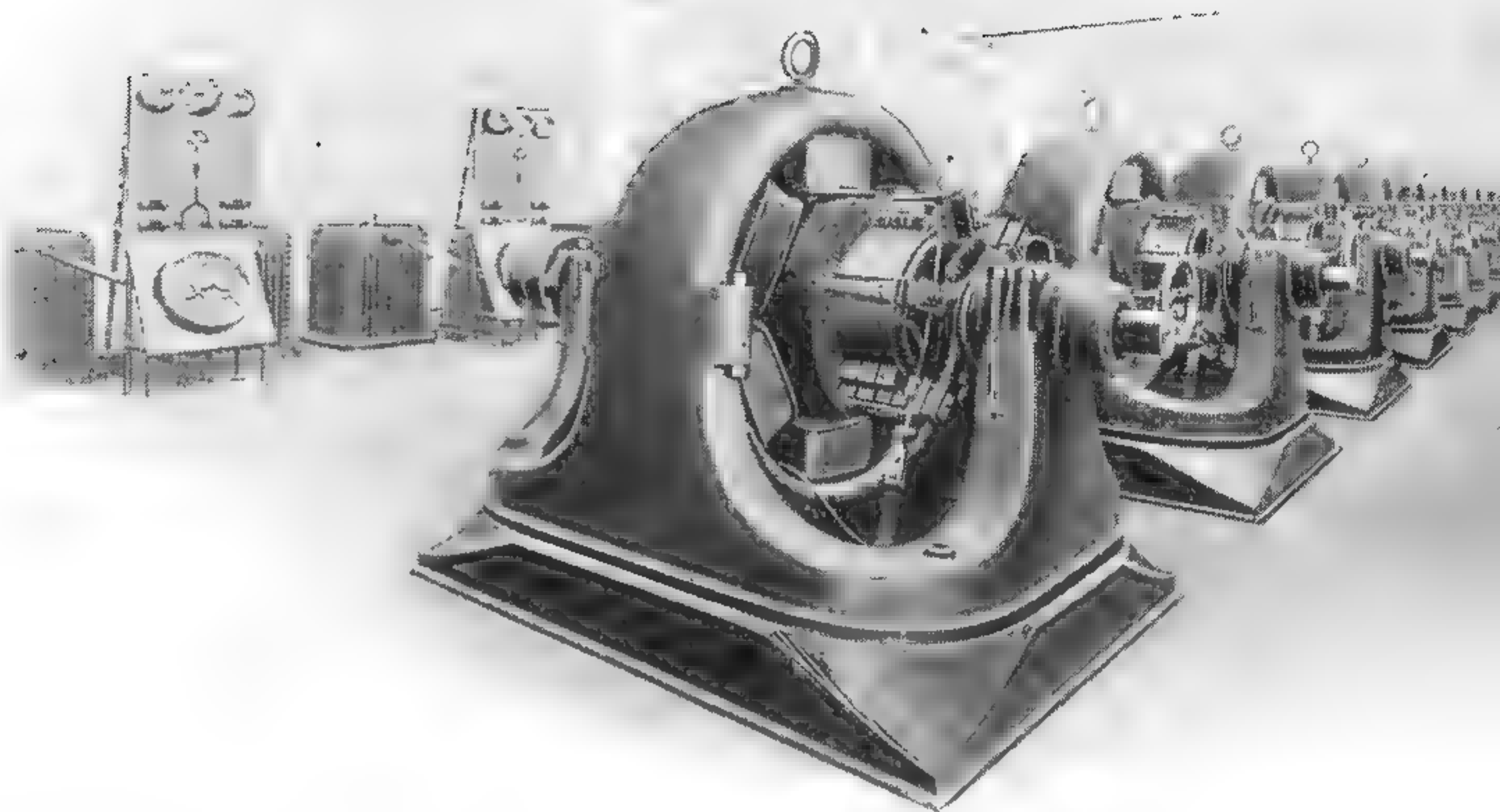
*The
Carbo-
rundum
Company*

The abundance as well as the cheapness of electrical energy made available by this large development at a great transportation center like Niagara Falls, has made it possible for The Carborundum Company, which, like The Pittsburgh Reduction Company, had for some years been operating by steam upon a smaller scale in Pennsylvania, to produce here its product in quantities and at prices which have given the Company great advantage in its competition with the mined abrasive minerals, now being supplanted by the product of this Company's furnaces. This tenant recently has doubled its plant upon the lands of the Power Company, and is now using in excess of 2,000 E. H. P.

Originally carborundum was made in grains only, but lately the plant has been very considerably enlarged, with the addition of much new machinery. At present the product consists of grinding and polishing materials, such as wheels, hones, cloth, paper, grains and powders. The electrical apparatus consists of special regulating transformers and induction motors.

Electrolytic and electro-chemical processes upon a large scale present much that is new and striking, but none are of greater interest than the carborundum processes, whereby an artificial abrasive is made in much the same way that the diamond came into existence.





This Company has an extensive branch plant covering about five acres of the lands of the Power Company, and is using some 2,400 E. H. P. in the production by the Castner process of caustic soda and bleaching powder. This branch of that Company's works has been so successful that the Company is now constructing an additional plant twice the size of the original one, and within a few months will be using 7,200 E. H. P.

Entirely pure and unadulterated caustic soda and chlorine are obtained by the direct splitting of salt by electrolysis. Electrolytic processes depend upon absolutely continuous and reliable electric power, which the Castner Company publicly state they have been able to find nowhere cheap and in sufficiently large quantity for their use except from the power development of The Niagara Falls Power Company.

***Castner
Electrolytic
Alkali
Company***



**Union
Carbide
Company**

Substantially all of the carbide of calcium used in the United States is manufactured upon the lands of The Niagara Falls Power Company by the Union Carbide Company. This Company has constructed upon the Power Company's lands, with other buildings, two brick buildings for furnace purposes, each over 800 feet in length, and up to this time has made the largest use of electrical power for furnace purposes of any one plant in the world.

Current is supplied to automatic continuous furnaces which produce the gas-bearing carbide. Small induction motors operate to revolve the furnaces, and other and larger motors drive grinders, conveyors and sundry other machinery necessary in such an establishment.

One of the important features of such an installation is the necessary repairs required by the furnaces. Each furnace is equipped with its own motor, and consequently any one can be stopped for examination without interfering with the balance. At the same time the power consumption is minimized.

**Niagara
Electro-
Chemical
Company**

This plant, using the Castner processes for the manufacture of a largely varied line of electro-chemical products, like the Castner Company, is also now engaged in duplicating its original plant and extending its use of electrical power.



At the date of the writing of this article over 1,200 men are upon the pay-rolls of the contractors of this Company engaged in constructing a mammoth plant extending over two blocks of the most valuable part of real estate of the City of Niagara Falls. This plant is of gigantic proportions and is being built upon the most approved lines of modern factory construction. It is expected that the work will be completed upon May 15th, and from that date the Company has contracted with The Niagara Falls Power Company to use 2,500 E. H. P. for the operation of its motors for lights and for electrical baking.

The use of motors will greatly facilitate their work, while the feature of baking with electric heat will render the product absolutely uniform, free from odor and from any possible contamination due to the presence of dust or gases, as would be the case with any other method. The plant looks out upon Niagara's Upper Rapids, and is within spacious grounds.

*The
Natural
Food
Company*



***International
Acheson
Graphite
Company***

One of the most interesting recent developments of the uses of the electrical current in the arts is a furnace process for converting hard amorphous carbon into pure graphite, invented by Mr. E. G. Acheson, and put in use on a large scale by the above-named Company in its plant on the Power Company's lands. 1,000 E. H. P. is at present used in this plant and already it is contemplated to double the capacity. The graphite produced answers every requirement of the mined article prepared by nature, in a similar way in its own laboratory, and has the additional advantage of being more nearly absolutely pure graphite.

***The Francis
Hook and
Eye
and Fastener
Company***

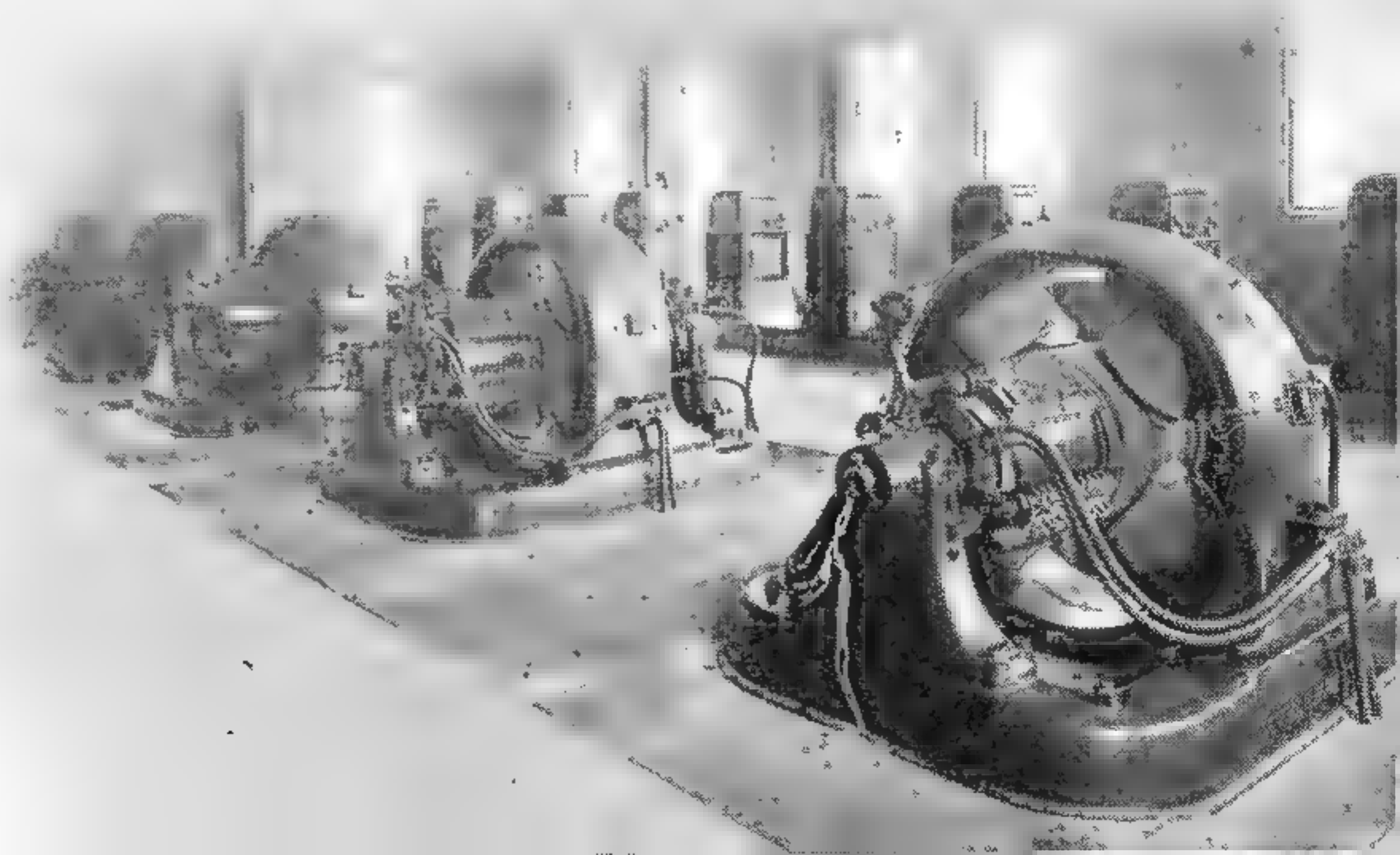
The view below is a manufacturing establishment of almost ideal construction, and is referred to upon the succeeding page as an institution making hooks and eyes and fasteners. Motors are used for driving the automatic machinery which receive the raw material and turn out the finished product.





Some of the other users of electrical power on the lands of the Power Company in the City of Niagara Falls are the BUFFALO AND NIAGARA FALLS ELECTRIC LIGHT AND POWER COMPANY, which provides the municipal and domestic electric lighting of the city; the trolley systems using about 1,000 E. H. P. converted into direct current at the required voltage by transforming machinery installed in the Power Company's station; the FRANCIS HOOK AND EYE AND FASTENERS COMPANY, using about 50 E. H. P. for motors driving its machinery; THE ELECTRICAL LEAD REDUCTION COMPANY, using 500 E. H. P. in the reduction by electrolysis of lead and lead oxide from galena; THE FRENCH-HICKMAN FLAX FIBRE COMPANY, preparing to use 400 E. H. P. for its motor-driven machinery; THE ACETVONE MANUFACTURING COMPANY, using 75 H. P. for driving its machinery; THE AMPERE ELECTRO-CHEMICAL COMPANY, THE OLDBURY ELECTRO-CHEMICAL COMPANY, and the ROBERTS CHEMICAL COMPANY, using various amounts of electrical currents in the electrolytic and electro-chemical manufacture of various chemicals.

Other Users of Power



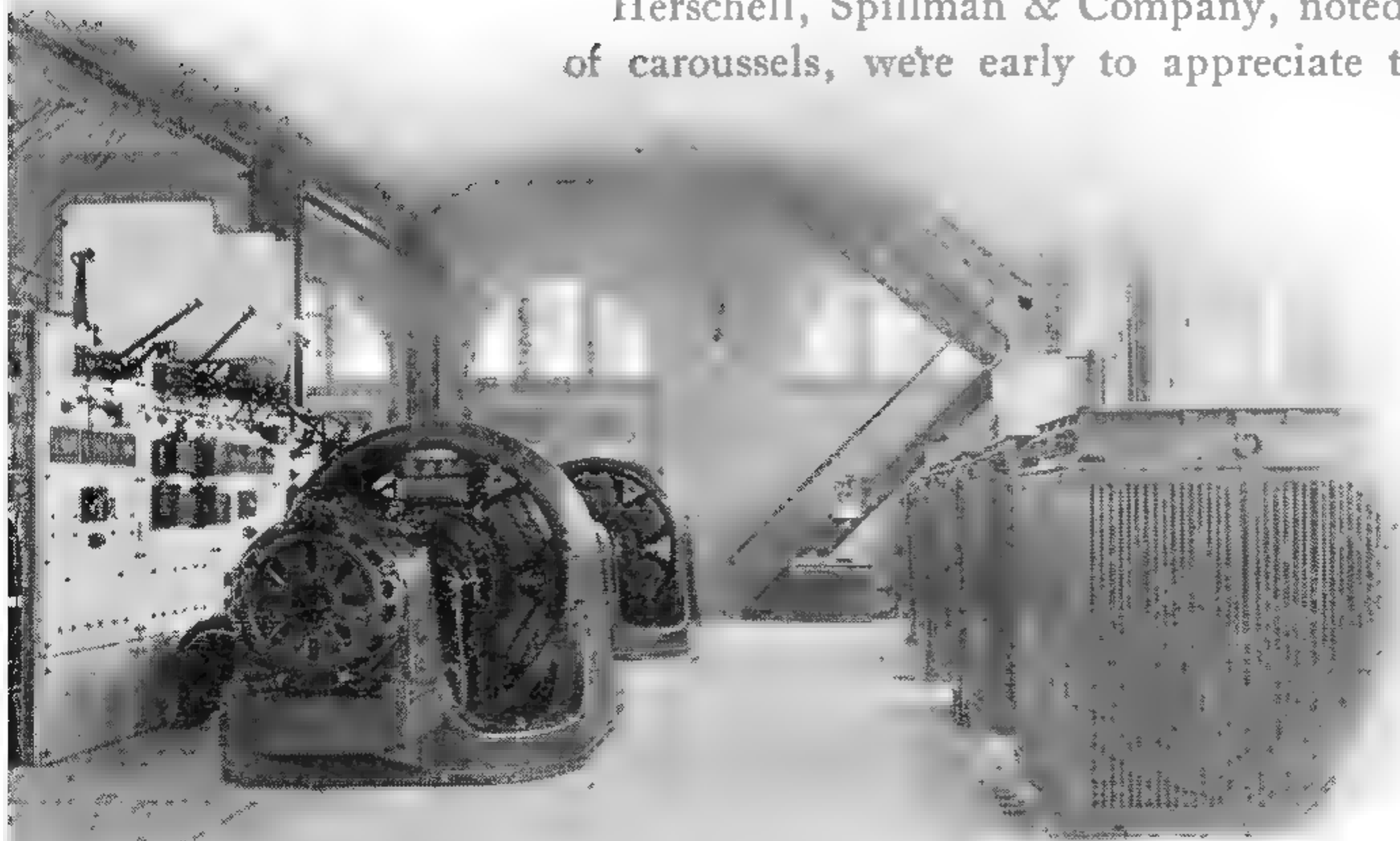
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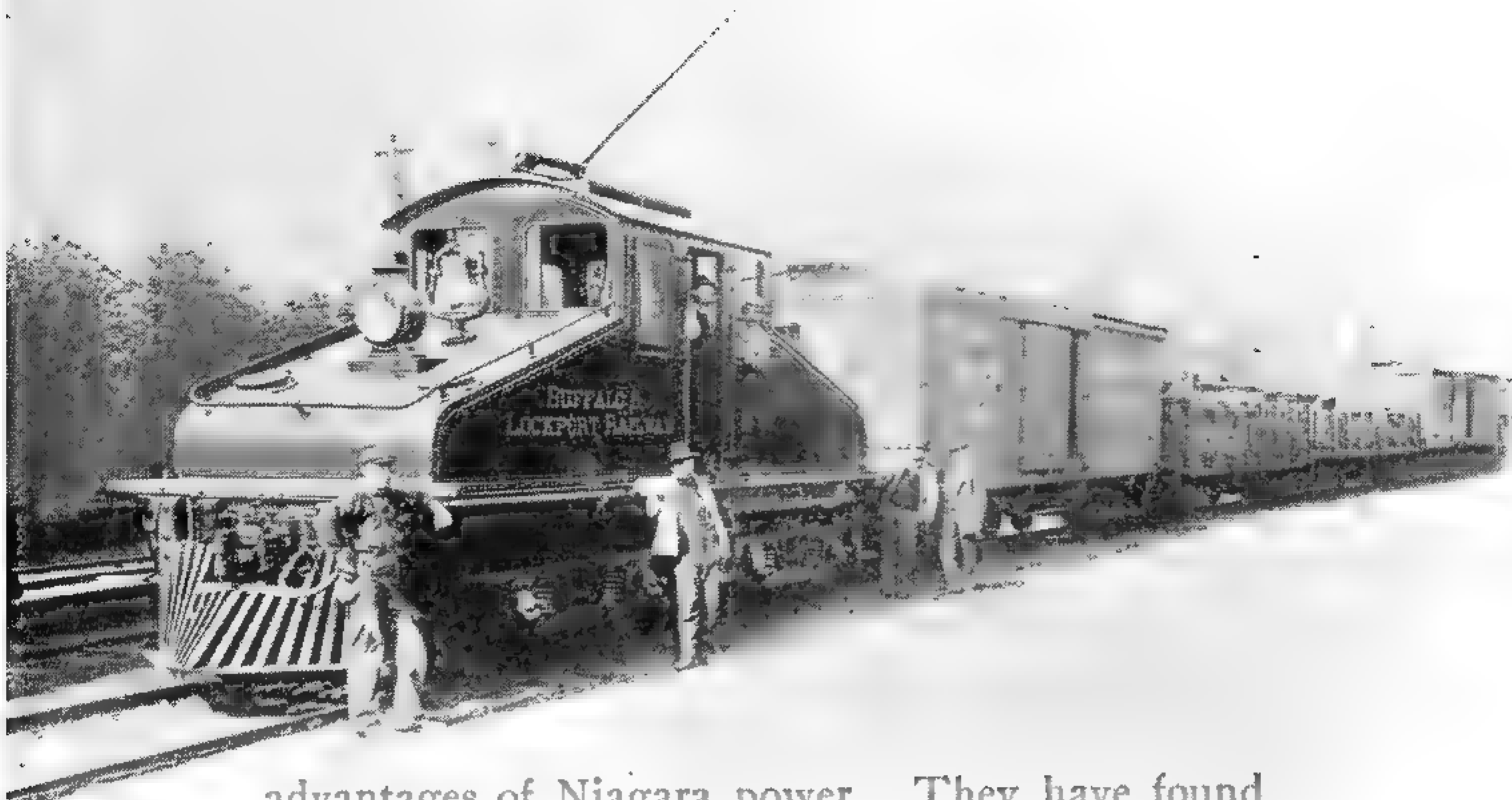
Halfway between Niagara Falls and Buffalo on the Niagara Frontier is the station of the Tonawanda Power Company, supplying light and power to Tonawanda and North Tonawanda. The Buffalo & Niagara Falls Electric Railway and the Buffalo & Lockport Railway obtain power from the Tonawanda Power Company.

Among other users of electric power in the Tonawandas are to be mentioned F. A. Alliger, who operates a planing mill and box factory. He has installed several motors to replace a steam engine. The motors operate planers, matchers, saws and other equipment to be found in establishments of like kind.

Previous to the adoption of electric power, steam was generated from shavings as fuel, but a study of the conditions revealed the fact that such operation was most expensive. It is possible to sell baled shavings and sawdust at a fair price, and in this case enough shavings and sawdust are made in a period of six months to pay one year's power bills and the cost of the necessary electrical apparatus to supplant the steam equipment. The moral tone of the plant has been greatly improved, and the fire risk greatly reduced. Moreover it is now possible to operate the light machinery without running the heavier tools, because of the ability to sub-divide the power.

Herschell, Spillman & Company, noted builders of carousels, were early to appreciate the many





advantages of Niagara power. They have found much satisfaction and profit in the use of electric motors to drive the various machines by which they effect the clever merry-go-rounds and other articles of their product.

Becker Brothers also use the power in their establishment, where they manufacture overalls and other articles of clothing.

The municipality also utilizes Niagara Falls power for motors which drive blowers of ventilating systems in the public schools.

The view on the opposite page shows a part of the interior of the Tonawanda Power Company's Station. The machines shown transform the Falls power into direct current for use of the electric railways. Other machinery in the station transforms the power for incandescent and arc lighting, and for the general power service.

The cut on this page shows one of the electric locomotives which is used for freight service between the Tonawandas and Lockport. This engine is capable of hauling twenty or more loaded freight cars at the regular freight speed. It operates just as well at Lockport, 25 miles from Niagara, as it would be possible for it to do at any intermediate distance.



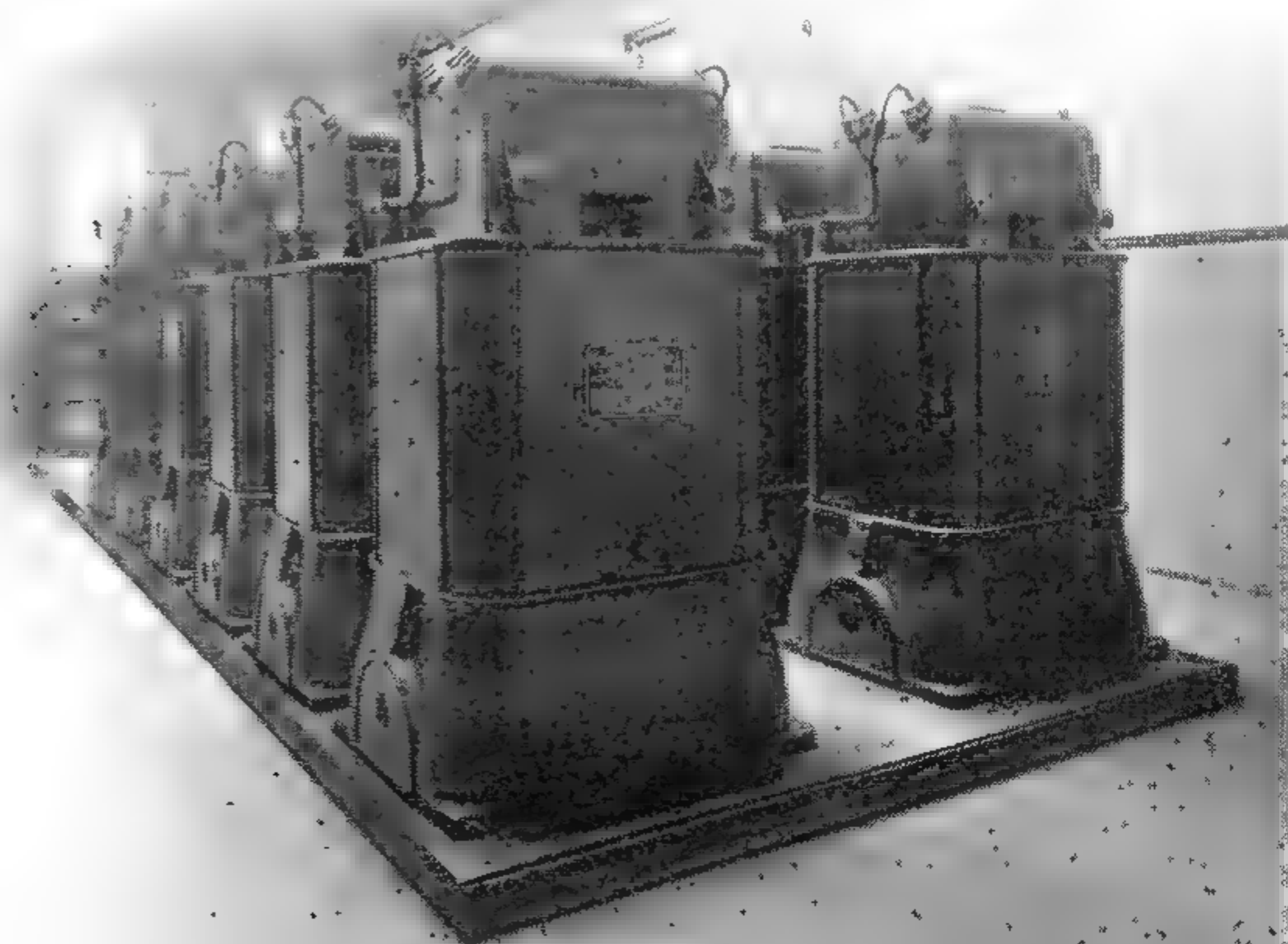
Niagara Power in Buffalo

The Cataract Power and Conduit Company is the sole selling agent in Buffalo of the Niagara Falls Power Company.

At the foot of Ontario Street, in the City of Buffalo, the transmis-

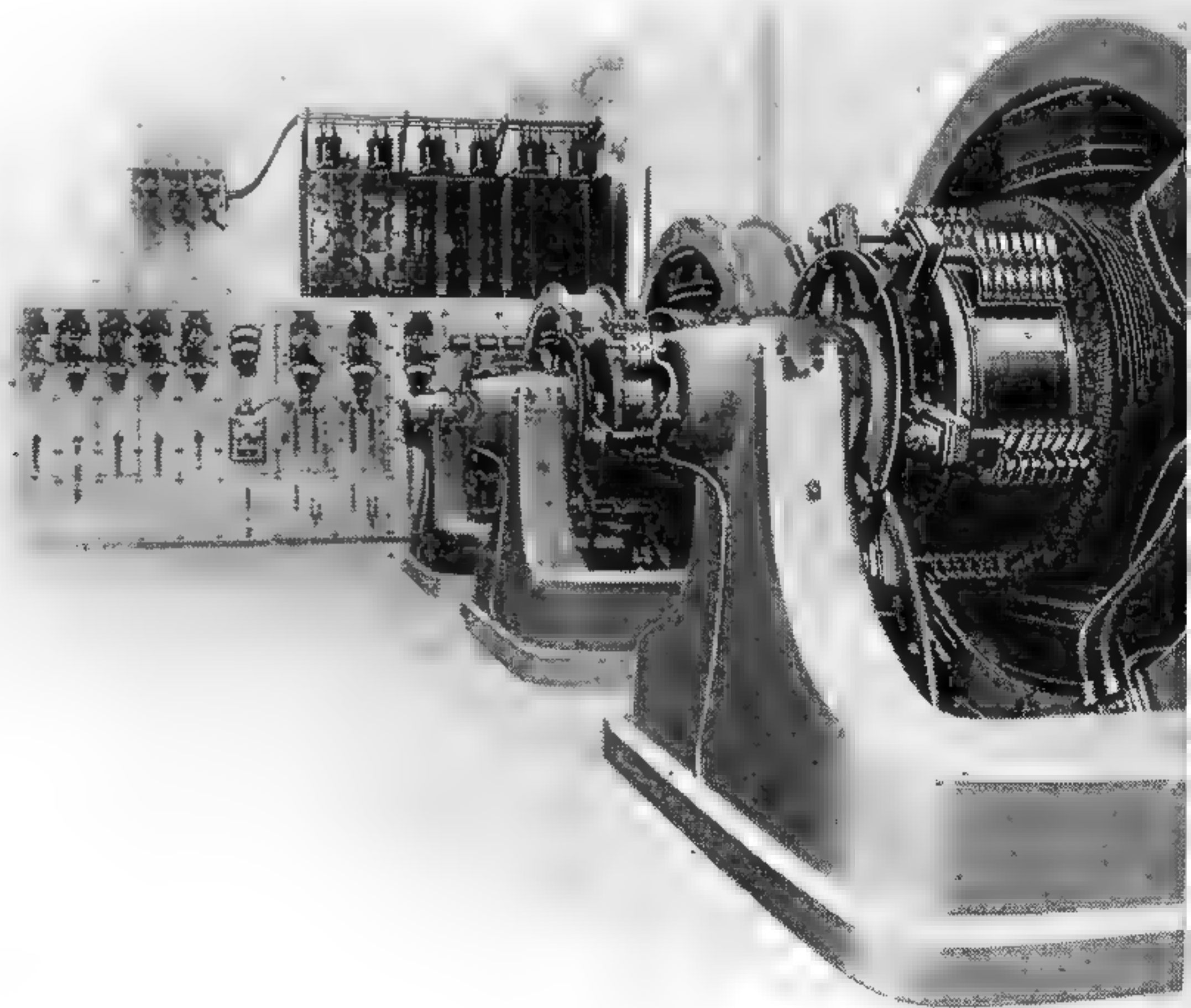
sion lines from Niagara enter a terminal house. This is the main distributing station for the entire city. From this point the power is carried underground to the three sub-stations located respectively in the plant of the Buffalo Railway Company, on Ohio Street and Love Alley, and at the station of the Buffalo General Electric Company on Wilkeson Street. Each of these sub-stations control certain districts of the city. They are so designed and equipped that Buffalo today has the most comprehensive and reliable power service of any city in the world.

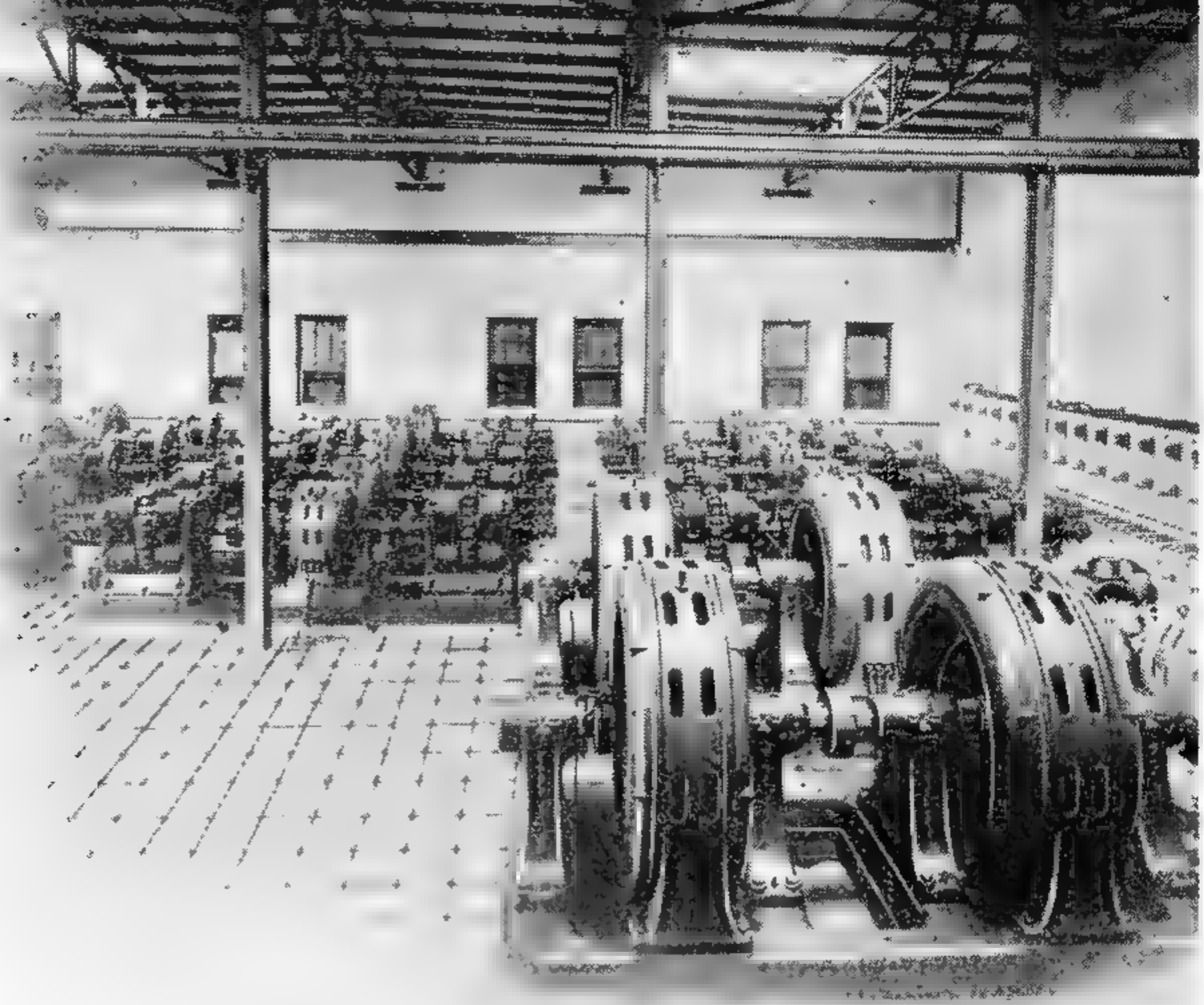
The upper view is from the sub-station on Ohio Street and Love Alley, and shows the large transformers with high-tension switchboards, traveling crane, etc. The lower view, from the Wilkeson Street station, shows a bank of air-blast transformers for furnishing current to consumers near the center of the city.



First and largest among the installations to adopt Niagara power is to be mentioned the Buffalo Railway Company. Before the advent of the Falls power, the railway company was operating a thoroughly modern, central generating power station, located on Niagara Street, near Prospect Avenue. The equipment in that station consisted of simple and compound condensing engines, ranging in size from 300 to 1,000 H. P. Such engines were utilized for driving by belt or direct connection generators which delivered current for the entire system. In all details that power station was of such nature and design as to insure the generation of electric energy as economically as it could be done anywhere in this country. Notwithstanding such fact, however, it has been demonstrated that Niagara Falls power is not only cheaper, but better in every sense for their purpose. Throughout the city they have five different sub-stations where they receive power from The Cataract Power and Conduit Company, and deliver it to the different sections of their system, thereby securing flexibility and uniformity.

***Buffalo
Railway
Company***





*Buffalo
General
Electric
Company*

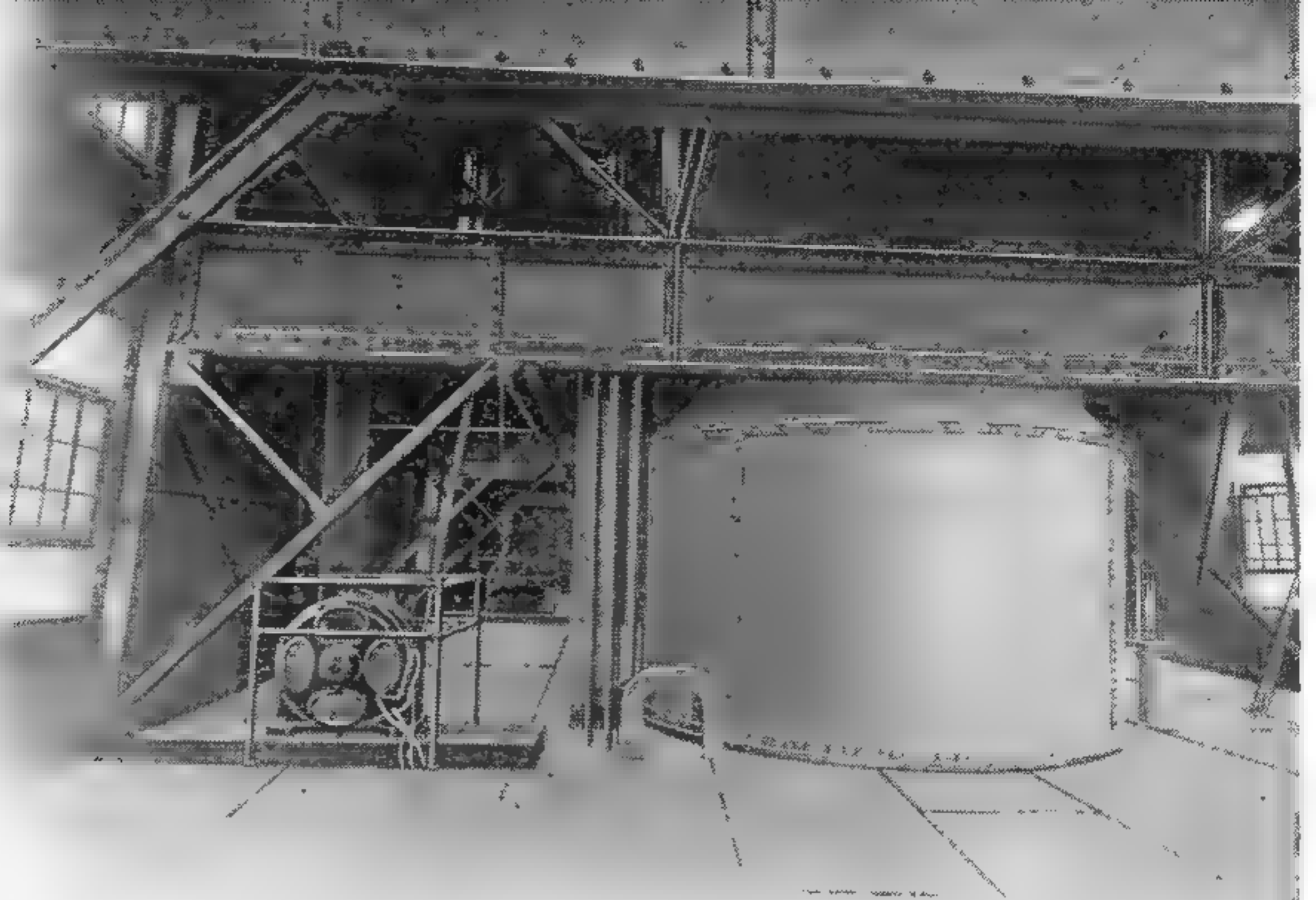
Next in size and of equal importance to the welfare of the city is the public and private lighting system, which in this instance is that of the Buffalo General Electric Company, whose plant is located at Seventh and Wilkeson Streets. Previous to the adoption of Niagara Falls power, this Company were operating two distinct and separate lighting stations, driven by steam power. The existence of two such plants required the maintenance of considerable machinery, and the attention of a double set of station attendants, from the boiler room through the list. In consolidating the two stations and utilizing Niagara Falls power, the operating department is at once cut in two, while the absence of a steam generating plant and steam engines further reduced the number of men necessary.

As a matter of fact, the central station of the Buffalo General Electric Company is today the most unique and the best equipped station of its kind in the world. The apparatus is extremely simple and easily maintained. The absence of belts is a noteworthy feature, and the compactness of the station quite evident.

First among the users of Niagara Falls power for private purposes is to be mentioned the Great Northern Elevator, for the storage and handling of cereals. The motors installed for operating the marine legs, house legs, conveyors, etc., aggregate 1,200 H. P. in capacity—some twenty in number. These motors are of the well-known induction type, the rotating element of which carries no moving electrical contacts, consequently carries no moving wire; there can be no sparking or flashing due to the passage of an electric current in the machinery, thereby minimizing attendance and making the item of repairs practically nil. The reliability and independence of such an equipment can in no better way be brought to mind than in the statement that the repair account for a plant of 1,200 H. P. has amounted to less than \$50 per year, and to the further fact that in this installation, which is also possible in every other, every motor is controlled from the same quarter. Upon the ground floor and in one corner of the building, separate and distinct from everything else, there is a switch-board room. Here the current is received from The Cataract Power and Conduit Company. The attendant in the switchroom receives notification by means of an annunciator or a telephone call that a certain motor is wanted in operation, whereupon

Great Northern Elevator





said attendant starts the motor from its corresponding switchboard panel. The motor in question may be 100 feet away or 1,000 feet, and, for all that, it could just as well be a mile. It is not necessary for anybody to see the motor start or to be near it, so simple, efficient and reliable is it in its operation. It is safe to say that no other type of motor ever devised can fulfill similar conditions.

By the use of induction motors, the fire risk in a grain elevator is very materially lessened. Other styles of motors present the well-known armatures and commutators, with the necessary brushes which bear on the latter. Grain dust is of exceeding fineness, and would soon interfere with the operation of a direct-current motor, causing sparking at the brushes, resulting in great deterioration and wear to the parts. At the same time, conditions might occasionally be such within a grain elevator, that the presence of such sparking would give rise to the well-known dust explosions, which are often serious in their consequences.

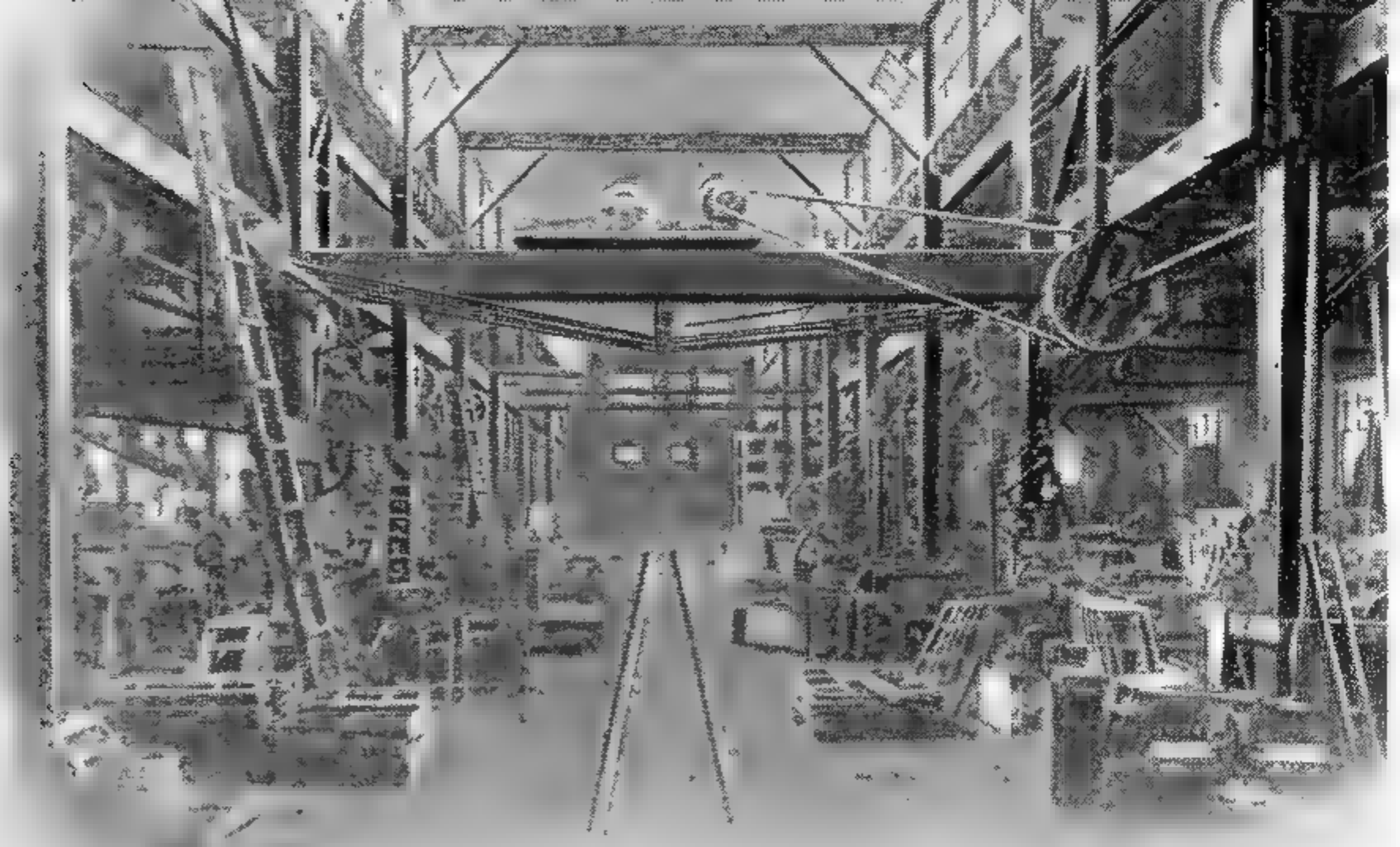
With the induction motor such dangers are eliminated, for the reason that sparking cannot take place. The only moving part is the shaft, which runs in a self-oiling bearing. There is no doubt but that a visit of inspection to the various installations herein mentioned will more than repay the effort.

Near by the Great Northern Elevator just mentioned, is another of similar nature, known as the Electric Grain Elevator, which also has for its purpose the storage and handling of grain from vessels to cars, and *vice versa*. The installation is of about 500 H. P., divided into a dozen or more units, each separately controlled. In fact, the general arrangement of machinery is very similar to that seen in the Great Northern, differing only, perhaps, in the method of connecting the motors to the equipment to be driven.

The Electric Elevator

Grain elevators are necessarily lofty structures, so as to facilitate the distribution of the cereals. For the operation of marine and house legs, which elevate the grain, power is applied at the top of a long leg within which the buckets travel on an endless belt. In the steam-driven plants, long, heavy and hence expensive lengths of shafting were needed. From these shafts, circuitous lines of belts or rope drives emanated, requiring much space, great care, and in themselves consuming a vast amount of power. Contrast such a method with the simple and effective plan shown in the picture.





*The
McKinnon
Dash
Company*

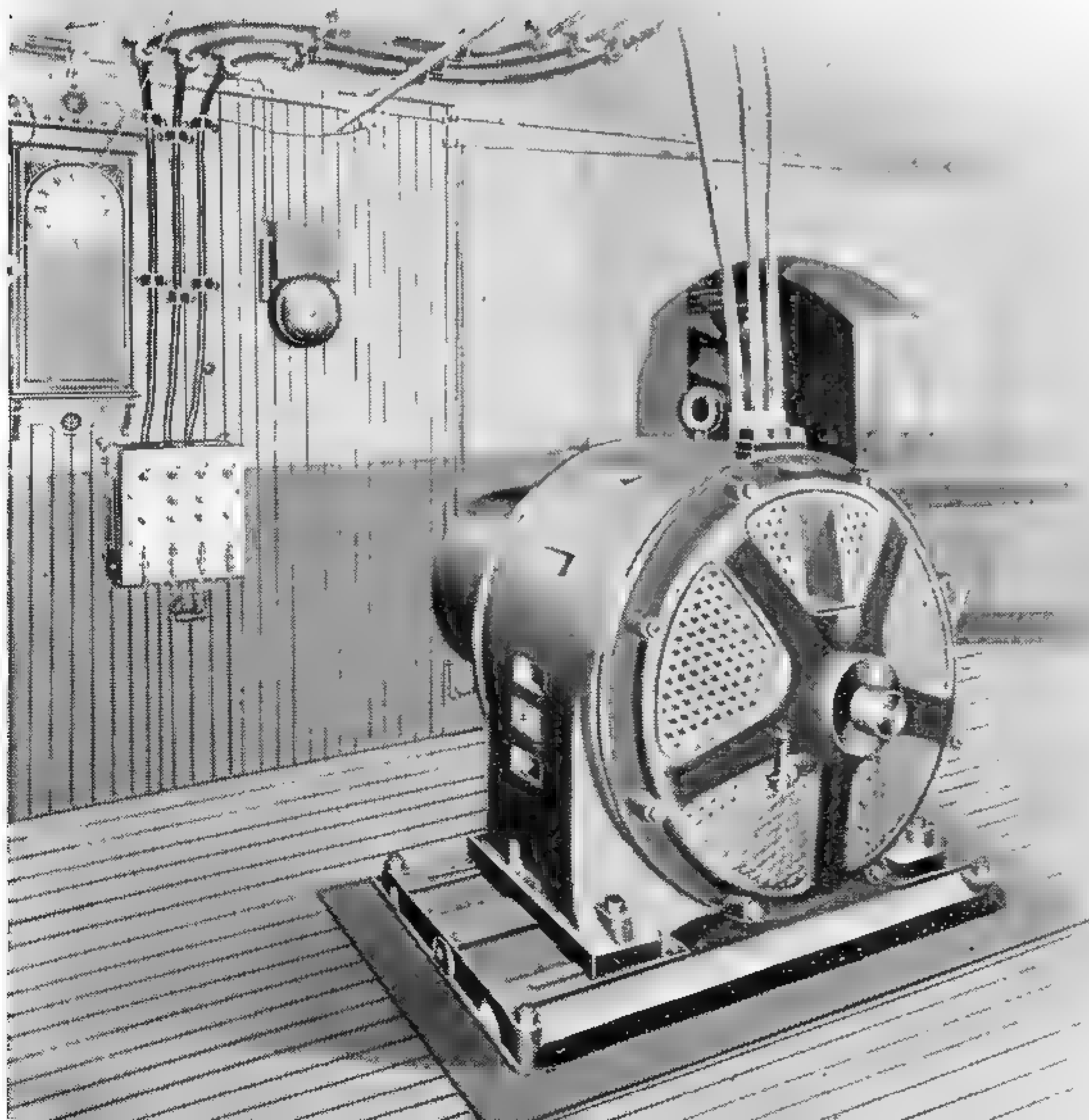
In general manufacturing it is probable that no institution possesses greater interest to the manufacturer than what is to be seen in the establishment of The McKinnon Dash Company, located on Amherst Street. Vehicle dashboards and fenders of every style are made at this factory. There is approximately 100 H. P. used continuously, subdivided in a number of motor units, driving groups of machinery throughout the building. Incidental to the power application pure and simple, the feasibility of electric welding has been demonstrated to a nicety. All welding of dashboard and fender frames is done quickly and far more effectively by the means of electric current. By the use of Niagara Falls power this plant has been able to increase its output with the same number of employees, while at the same time saving considerable expense in the item of power, as against the old method of operating a steam plant with long lines of shafting extended over a large amount of floor space.

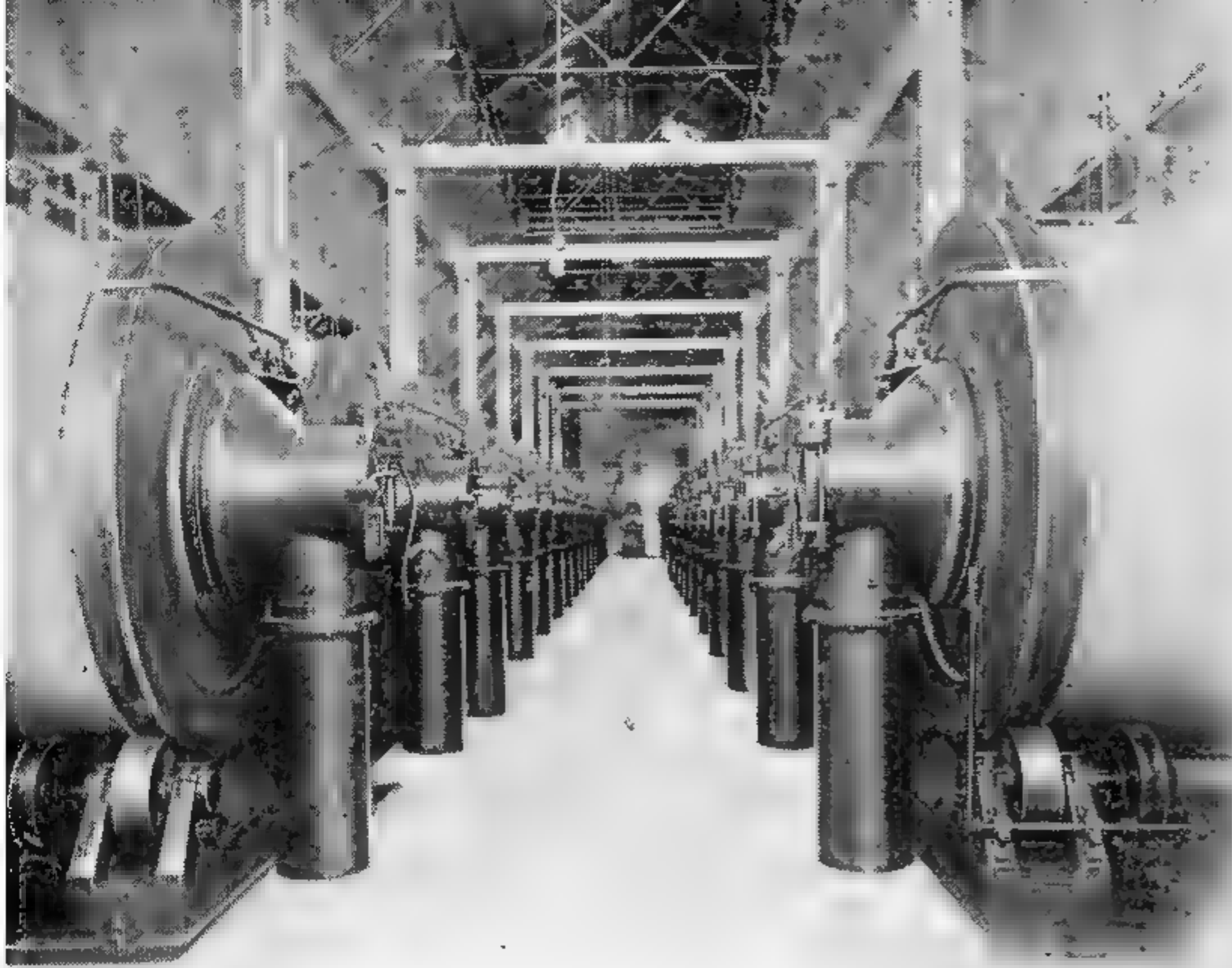
The view above is from the welding department, and shows two motors, out of the way and yet easily accessible. One side of the aisle can operate, while the other need have no machinery in motion.

With the growth of the power business and its attractiveness, not alone from the point of economy, but cleanliness as well, this book would be incomplete without some reference to the use of electric power in the production of one of Buffalo's leading newspapers, The Buffalo Express. There is here installed a motor of 125 H. P., which operates twenty-four hours per day, and performs the work in a most satisfactory manner. This motor also operates the machinery of The Matthews-Northrup Co.

*The
Buffalo
Express*

The saving in floor space is a feature which cannot escape notice. Just below the clock upon the wall is the starting device for the motor, which is complete in itself. The switch is thrown in, the motor comes up to speed under any condition of load, and work starts for the day with minimum effort and least attention.

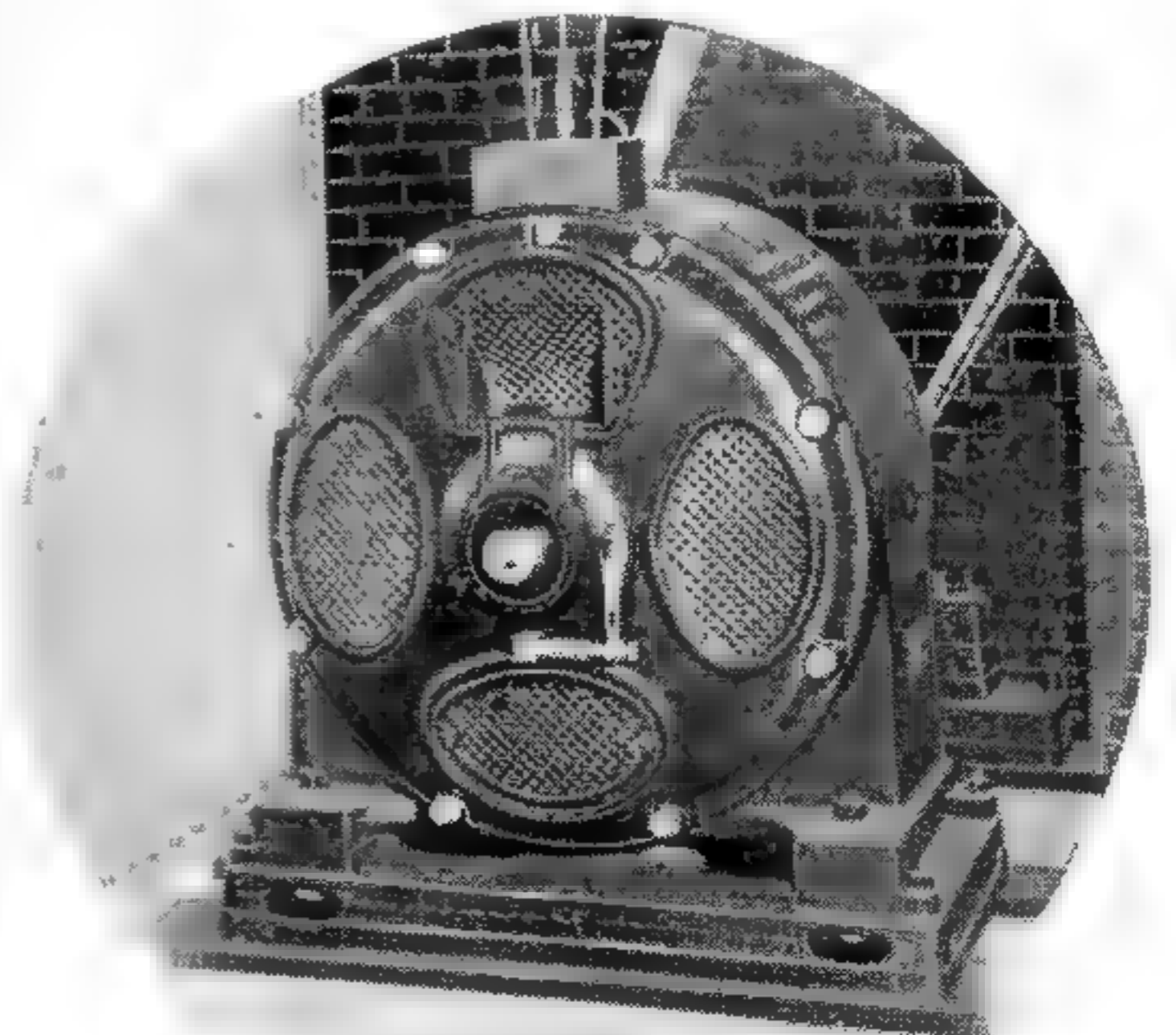


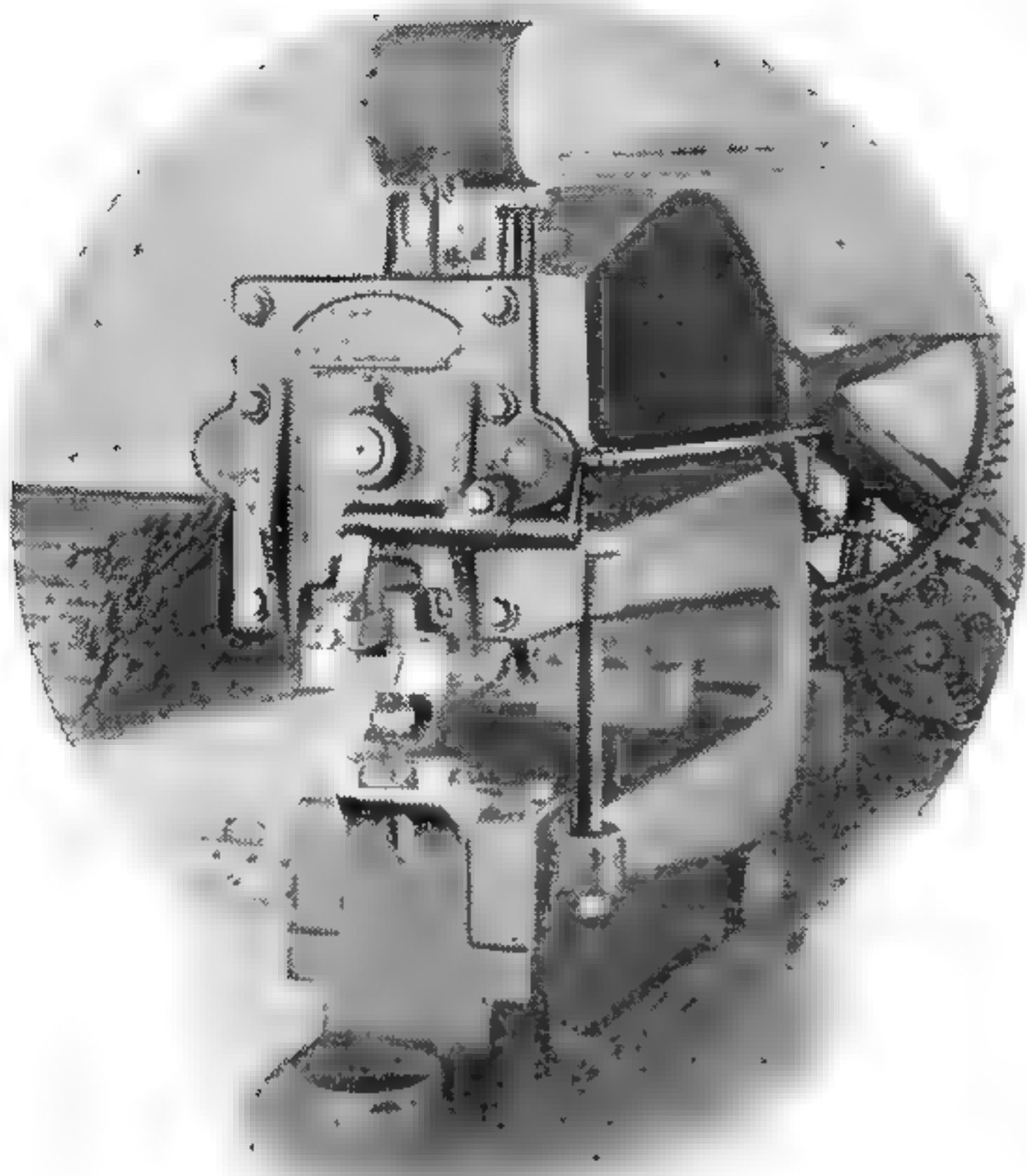


The Curtiss Malt House

A notable instance, proving the efficiency, etc., of Niagara Falls power is to be found in the plant of the Curtiss Malt House, on Niagara Street. Here there is installed a motor capacity of about 300 H. P., distributed in five units, and utilized for the various purposes of handling and conveying grain, revolving the malting drums, etc. Here the use of steam is necessary in the manufacture of malt, as well as a certain amount of heat from kiln fires. Notwithstanding the requirements of the case, it has been found that Niagara Falls power is more economical for the purpose than a steam plant could possibly be. Moreover, the item of cleanliness is surely of great importance in an industry of this kind, and the electric motors offer ideal conditions for such service.

The malting drums are arranged in two rows. They are driven by a single motor, through the medium of rope drives and worm gearing, to give the slow speed necessary.



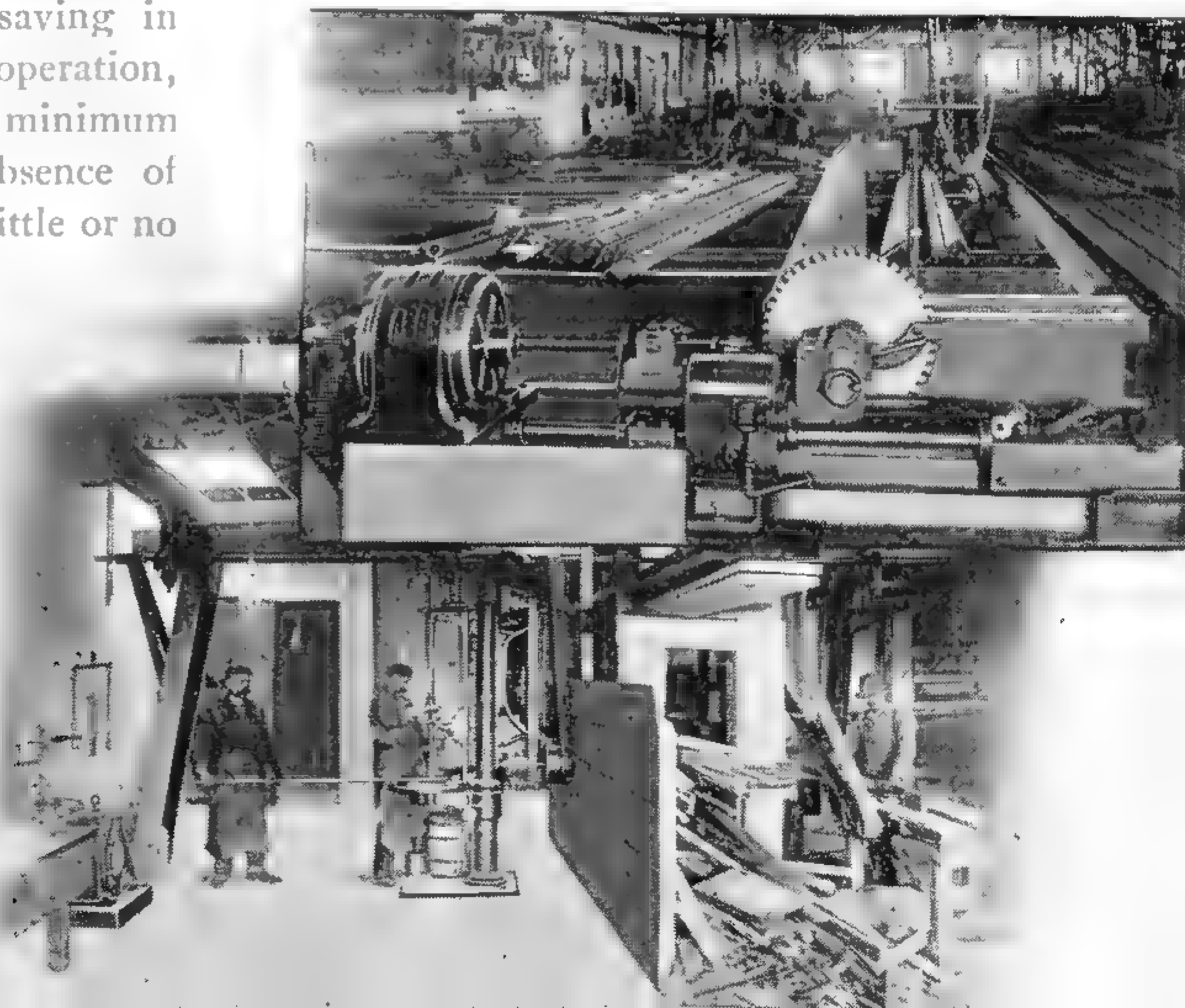


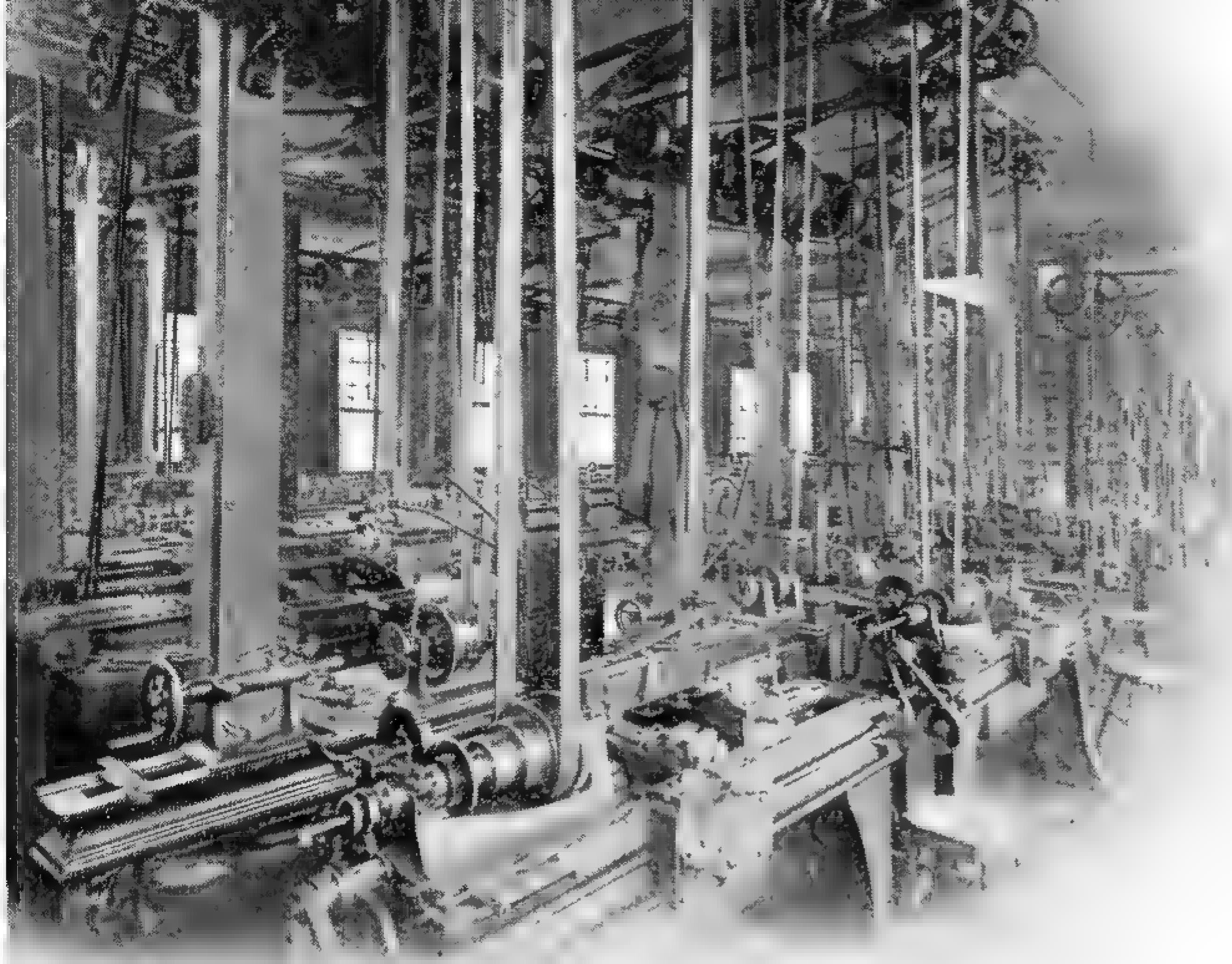
In the plant of the Buffalo Bridge Works, a branch of the American Bridge Company, a number of motors are installed, aggregating 125 H. P. These motors are used for the various purposes incidental

*The
American
Bridge
Company*

to the manufacture of structural steel, such as shears, punches, cranes, saws, rolling machines, etc. With a distribution of power, in the way of a number of motors, a plant of this kind is very much simplified, and parts of it individualized, enabling work to be done only when and where it is desired. New machines, each equipped with its own motor, can be added from time to time without the necessity of providing additional shafting or increasing the speed or steam pressure of an engine.

It has been found that with the use of Niagara Falls power there is a considerable saving in the expense of operation, because of minimum attendance, absence of belting, and little or no repairs.

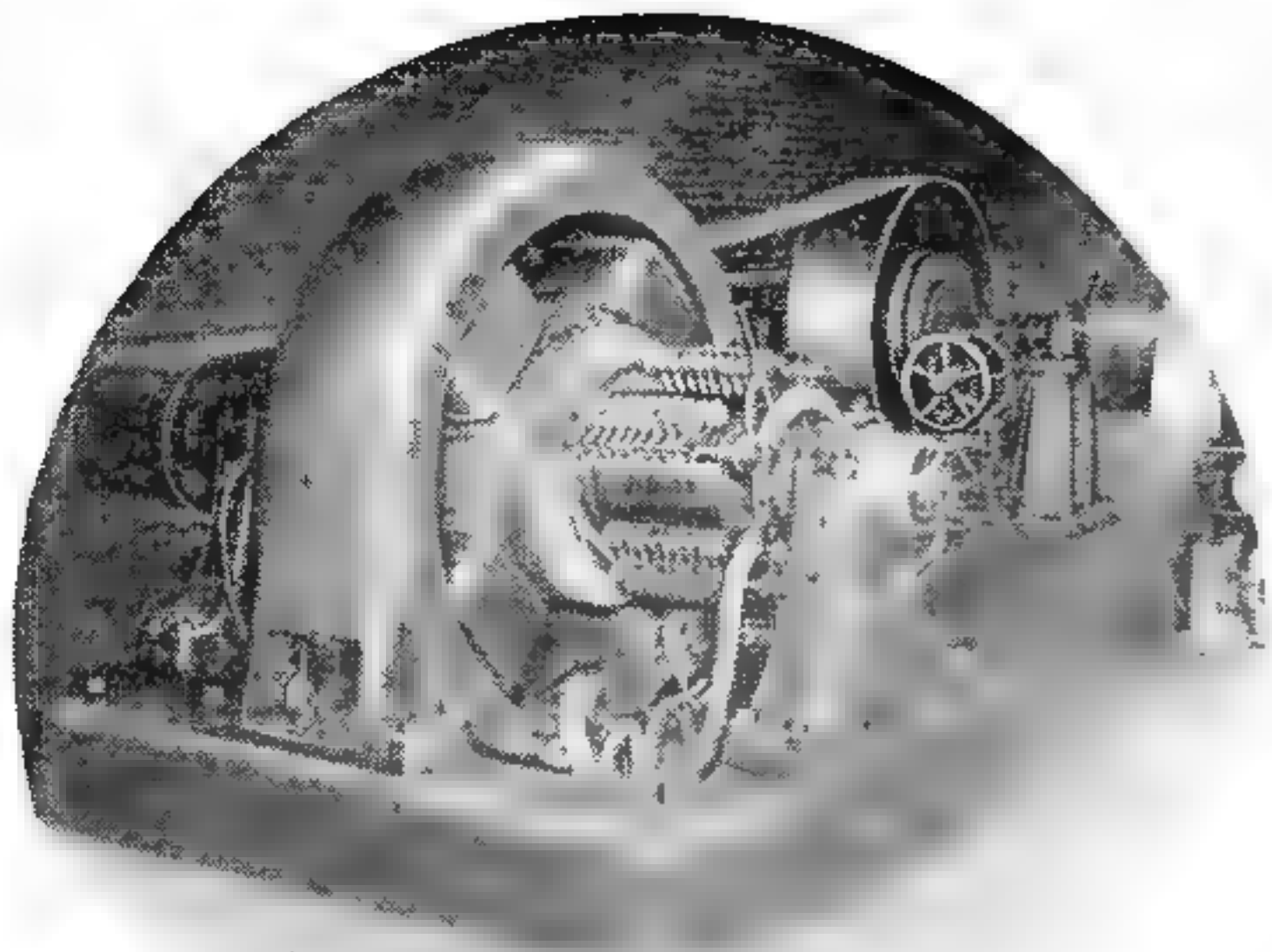




*The
W. W. Oliver
Manufacturing
Company*

The W. W. Oliver Manufacturing Company manufacture jewelers' supplies, polishing lathes, trip hammers, and certain other mechanical appliances of a highly finished character. They have installed a motor of 30 H. P., which does the work of a 50 H. P. engine formerly in use. Since the motor has been put in operation, they have been enabled to utilize the old boiler room for certain manufacturing appliances and thereby gained considerable floor space. They state that the absolute uniformity of speed which their motor gives them is a source of the greatest satisfaction, at the same time the cost of operating their plant has practically been cut in two.

A little over half of what was formerly paid the engineer, suffices to liquidate the bills for power. The motor is not shown in the illustration, but is installed on a lower floor, where it can be found in a corner, neatly housed in to prevent meddling. It is started and stopped from the working floor, in the simplest possible manner.



The Pratt & Letchworth Company are well known throughout the country as manufacturers of steel and malleable iron castings. Quite an extensive steam plant had been maintained

*The
Pratt &
Letchworth
Company*

by them, but a careful study of the advantages offered by Niagara Falls power, decided them to adopt the same for operating their plant. Upwards of 300 H. P. is utilized in a number of motors of various sizes, scattered over a widely distributed area. These motors operate traveling cranes, tumbling barrels and other classes of machinery to be found in an establishment of this kind.

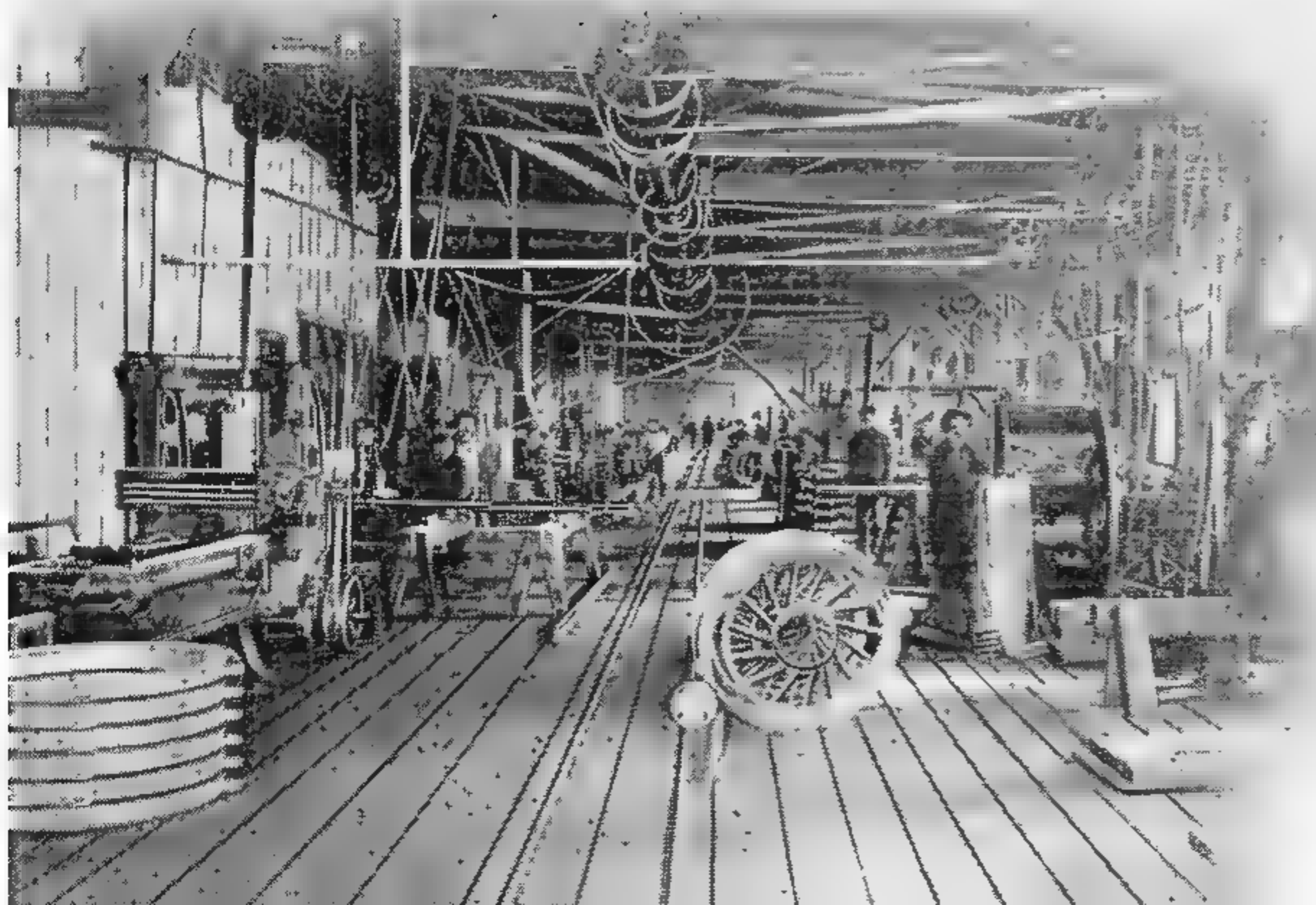
Originally this Corporation operated part of the works with motors deriving current from their own plant. The same motors are still in use, but now use energy from Niagara through the medium of the machine shown above. This piece of apparatus is a motor and a converter. With its shaft, part of the works are driven, while current passing in at one side as alternating emerges from the other side as a direct current for the operation of the original motors. Thus it is seen that the power is easily adapted to an existing condition, simply cutting out the steam plant.

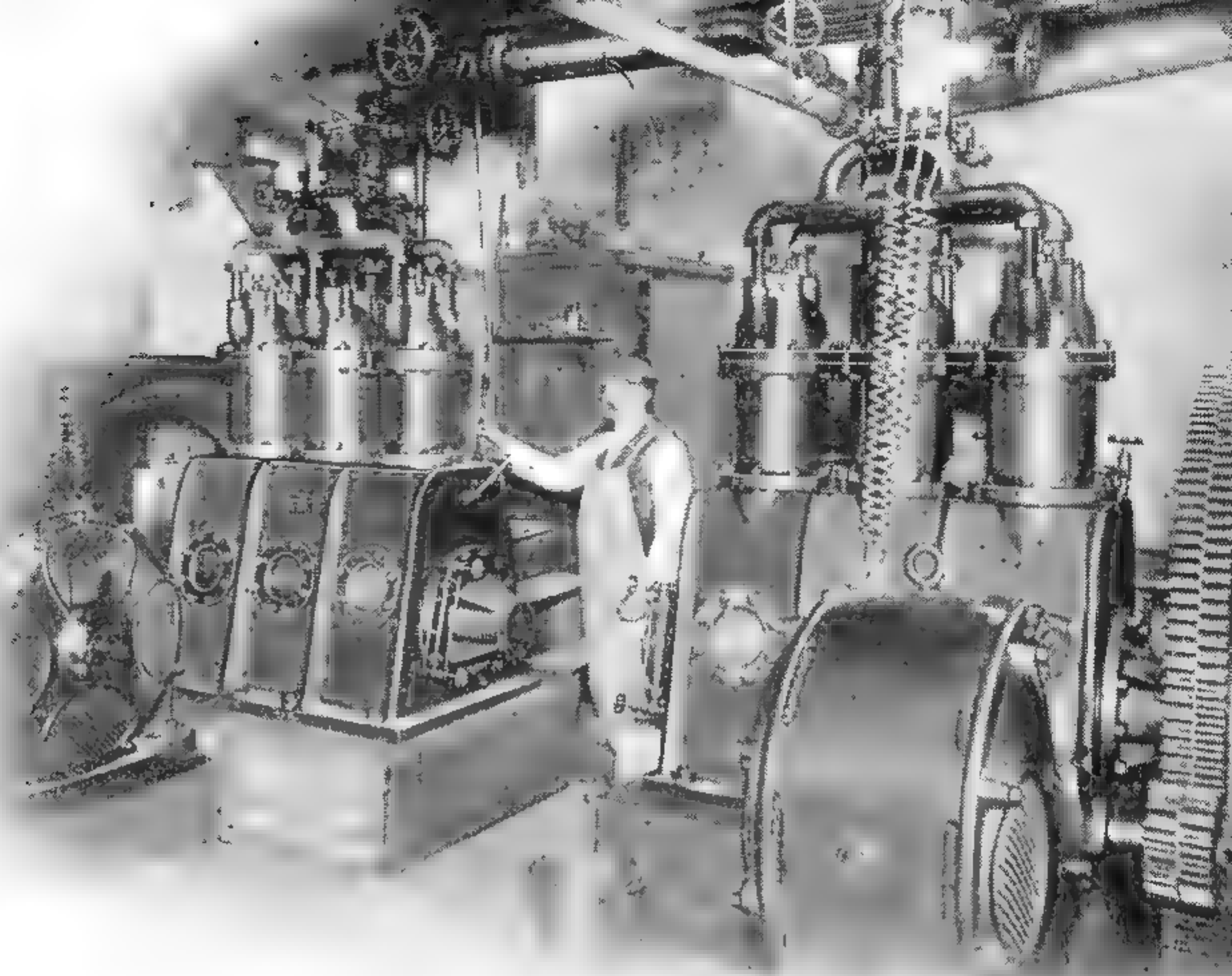


*The
New York
Car Wheel
Works*

The New York Car Wheel Works require about 200 H. P. for the operation of four motors driving different kinds of machinery. This establishment turns out about four hundred finished car wheels per day. To produce the same the motors above mentioned operate air compressors, blowers, lathes, boring mills, grinding machines, presses, etc. The plant covers considerable floor space, but by using a number of motors they have been able to minimize the friction load and decrease the operating expense by a handsome margin.

Some months ago this establishment was visited by a fire, which destroyed the foundry, leaving the steam power plant intact, but otherwise crippling the operation. The Power Company was consulted with the result that in thirty-six hours a motor was secured, connections made, and the machine shop put in running order. But for such an arrangement, the factory would have been completely shut down for six weeks or more, thereby incurring considerable loss. Since that time, the entire installation has been overhauled, with the result that Niagara power will be used exclusively for power purposes. The Falls power is always available, easily and quickly applied to any condition of service, while the feasibility of adding a motor here and there, as occasion requires, meets the demands of an increasing business.





At the corner of Washington and Chippewa Streets stands the Schoellkopf Building, tenanted by small manufacturers. In the basement of this building three motors operate ice machines twenty-four hours per day, furnishing refrigeration for the market place across the street. From thirty to forty per cent. has been saved in the operating expense of this plant by using Niagara Falls power. At the same time a great deal of floor space has been recovered, and the basement of the building is not subjected to the intense heat of boiler and engine equipment during summer months.

The saving of labor is a considerable item in this instance, for the reason that continuous twenty-four hour power is necessary. In the steam plant a double shift of men were needed to operate the steam plant, whereas at present one man for each twelve hours does not have sufficient work with the power equipment to keep him busy. As shown in the cut, the refrigerating machines are of the three-cylinder compression type, with the motors geared direct to the main shaft.

The Schoellkopf Building

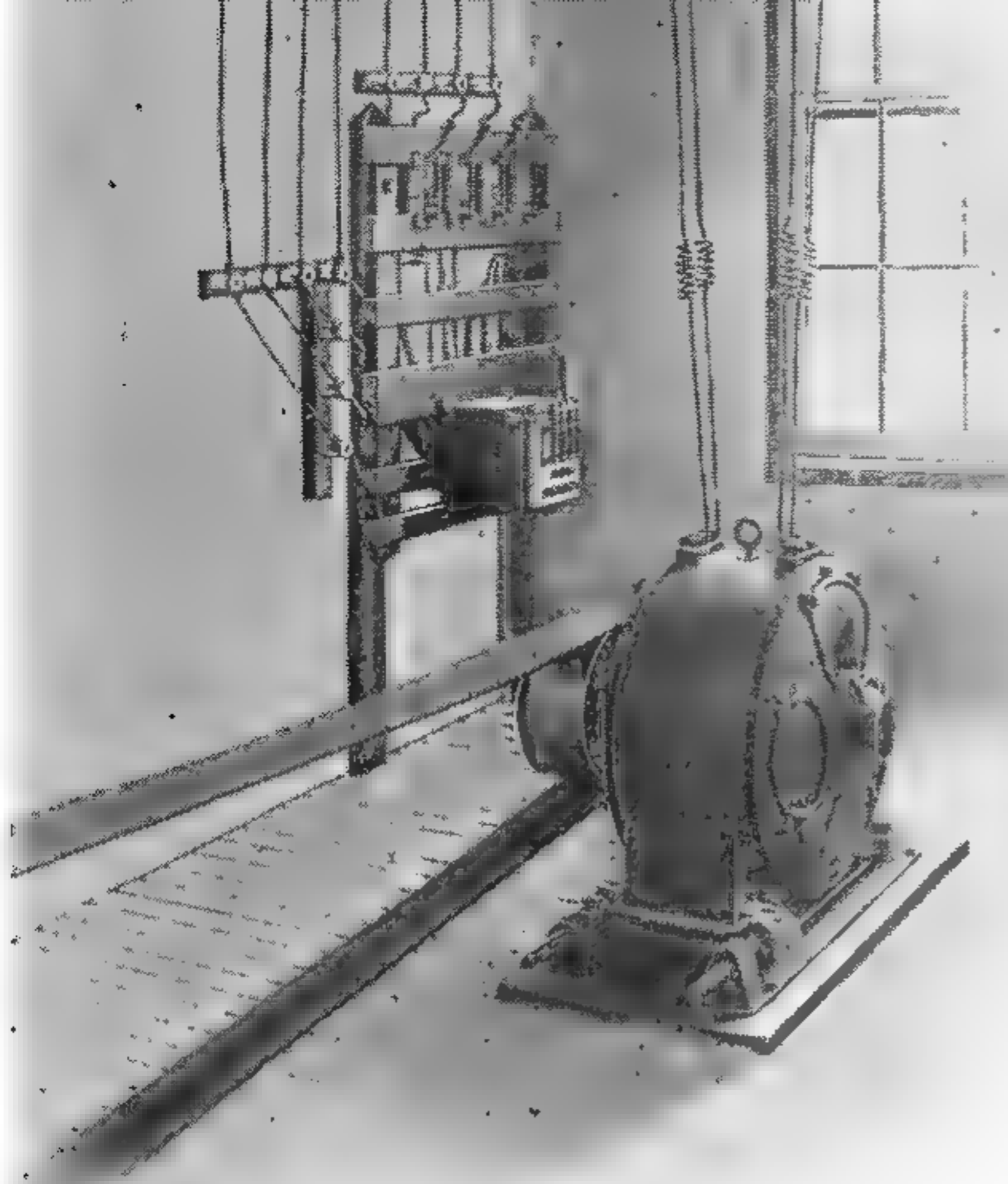
***The
Barcalo
& Boll
Manufacturing
Co.***

Of recent years the manufacture of brass and iron bedsteads has grown to be quite an important industry. Prominent among such manufacturers is the firm of Barcalo & Boll Manufacturing Company. They have but recently acquired new quarters, and equipped the entire factory with a number of motors to the extent of about 75 H. P. It is estimated that a steam plant of almost twice the size would have been necessary to perform the same work. Small motors are now utilized in different places on different floors, and in every instance suspended from the ceiling above. There is but little shafting on the premises and this of light construction. It is safe to say that no nicer, more compact and desirable equipment can be found anywhere than that which is to be seen in the plant of this Company.

One of the products of this firm is that of woven wire mattresses. The mechanism for the work is ingenious, but without the uniform speed such as Niagara Falls power affords, it is reasonable to suppose that results would not be as satisfactory.

A portion of the power equipment is shown below. The entire installation is controlled from this point.





If cleanliness is a desirable feature anywhere a bakery surely demands it. The Mugridge Baking Company have installed a 20 H. P. motor which operates the various light machinery necessary in the production of baked goods. Because of this Company using Niagara Falls power the attendance ordinarily necessary for a power plant is abandoned. The bills have determined that the cost of operating this plant averages just about one-half of what the engineers' wages formerly employed had been.

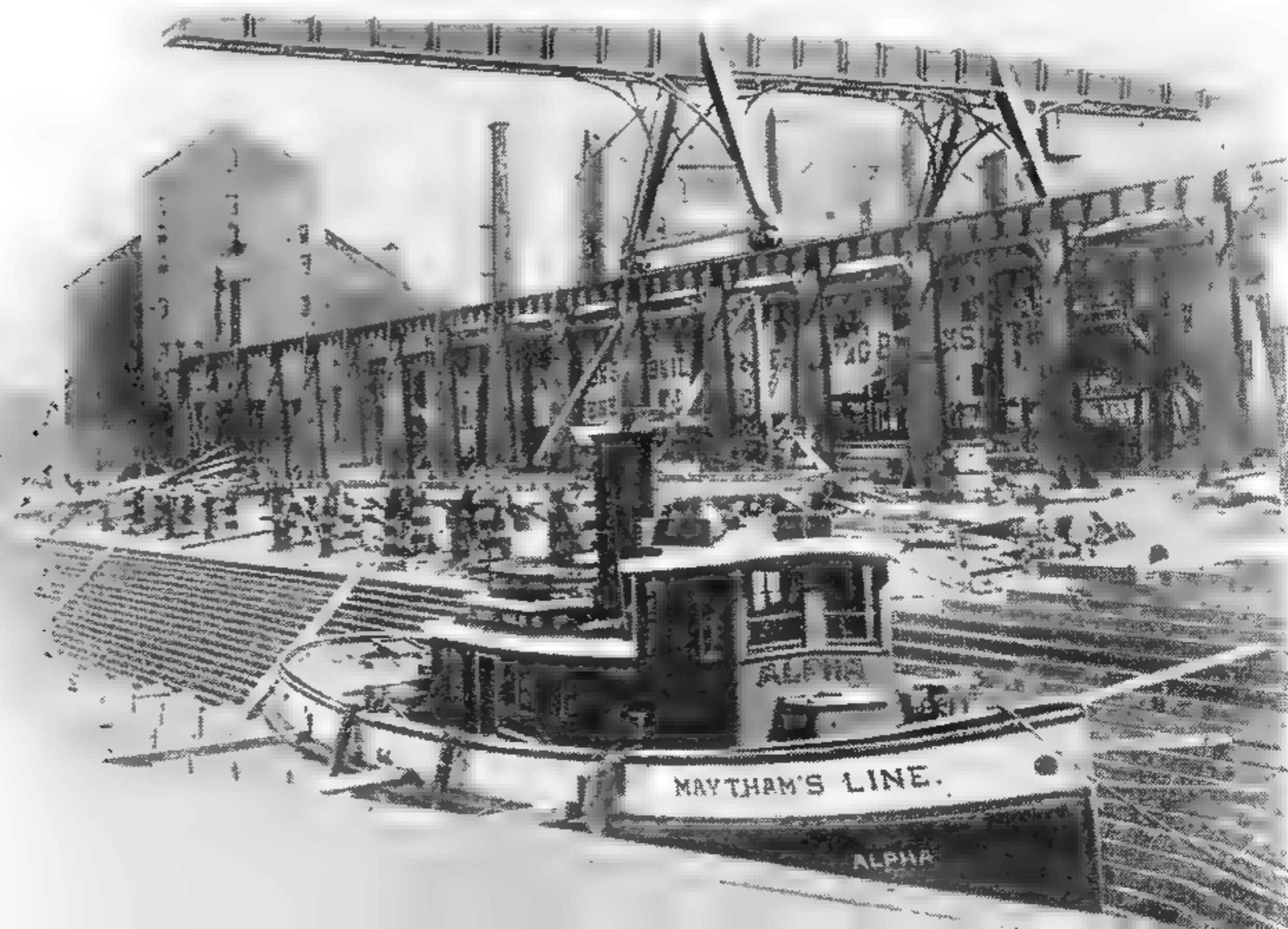
The product consists of a comprehensive line of cakes and crackers as well as bread and rolls. Consequently the operation of the plant is continued throughout the full twenty-four hour period. This formerly required the employment of a double shift of licensed men to maintain steam and run the engine. All of that is changed now, and no licensed men are necessary. In fact, no man is detailed for the power plant, for the reason that any employee is competent and capable of starting and stopping the motor, which merely requires the simple opening and closing of a switch.

*The
Mugridge
Baking
Company*



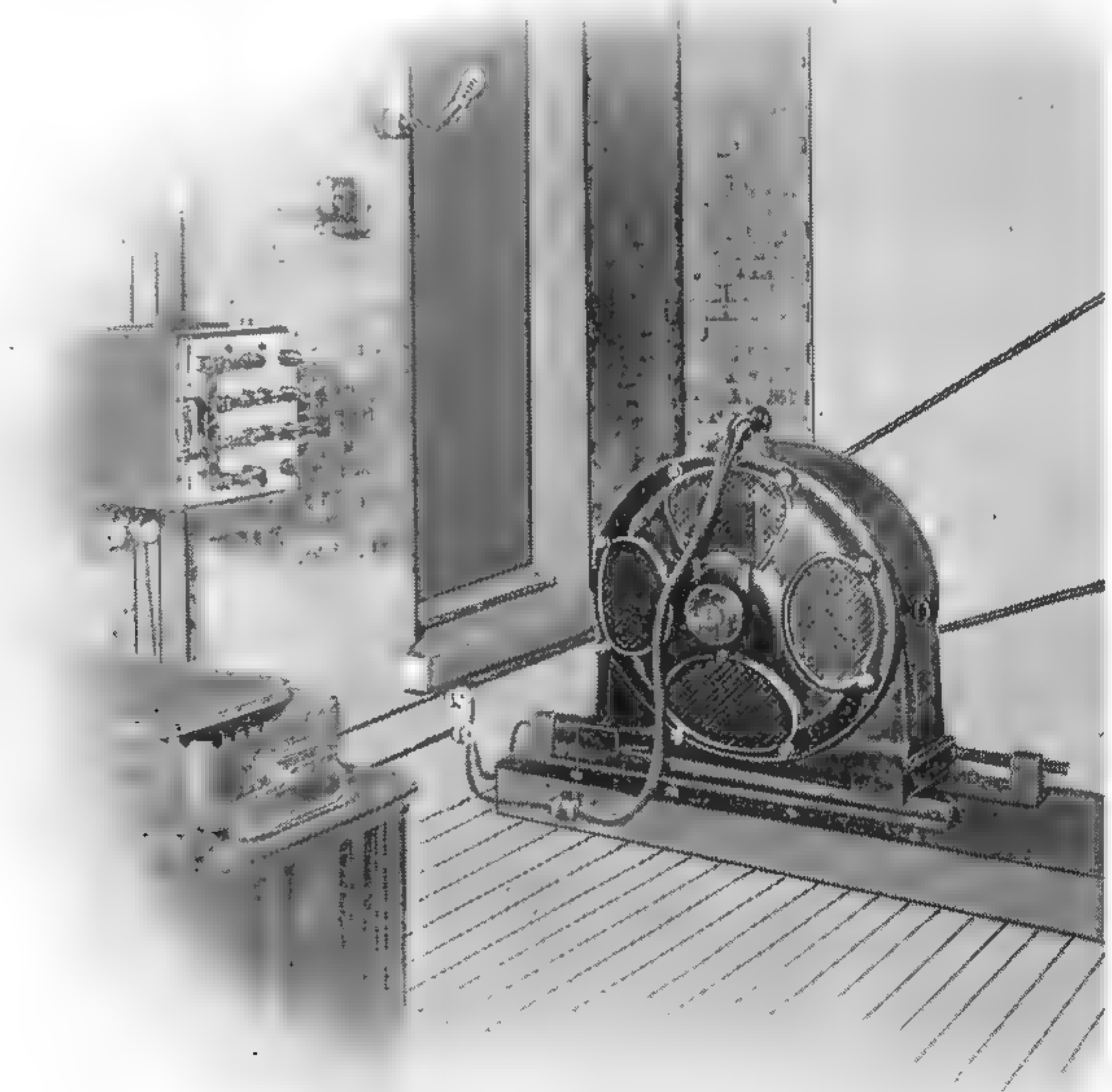
*The
Buffalo
Dry Dock
Company*

Electric motors and Niagara Falls power can be adapted to any purpose whatsoever, from the lightest work to the very heaviest. In the bakery above mentioned its every-day use is manifest, while in the plant of the Buffalo Dry Dock Company motors assist in all the processes of building the largest steel vessels that ply the Great Lakes. Upwards of 500 H. P. is required in this institution, utilized in almost forty motors of various sizes. These are to be seen in odd places apparently neglected, but always ready for any service demanded. Cranes, both large and small, are used in transporting heavy steel sections. Riveting machines, shears and punches assist in forming and joining all the parts which go to make a great vessel. The institution covers considerable area, and the motors are widely separated, but the entire plant is under far better control than it was ever known to be before.



For a year or more one of the largest tanneries in the State has been operating a part of its plant with one 50 H. P. motor. At the time of installing this it was thought to be ample for its needs, but its operation has been so satisfactory, the availability so clearly demonstrated, that a constantly increasing amount of work has been gravitating toward that department with the result that this Company is now preparing to increase the equipment. Notwithstanding the fact that the tannery requires a certain amount of steam aside from its power requirement, nevertheless Niagara Falls power so readily demonstrates its superiority that it is used for power purposes, and steam generated in addition where it is needed in the industrial work.

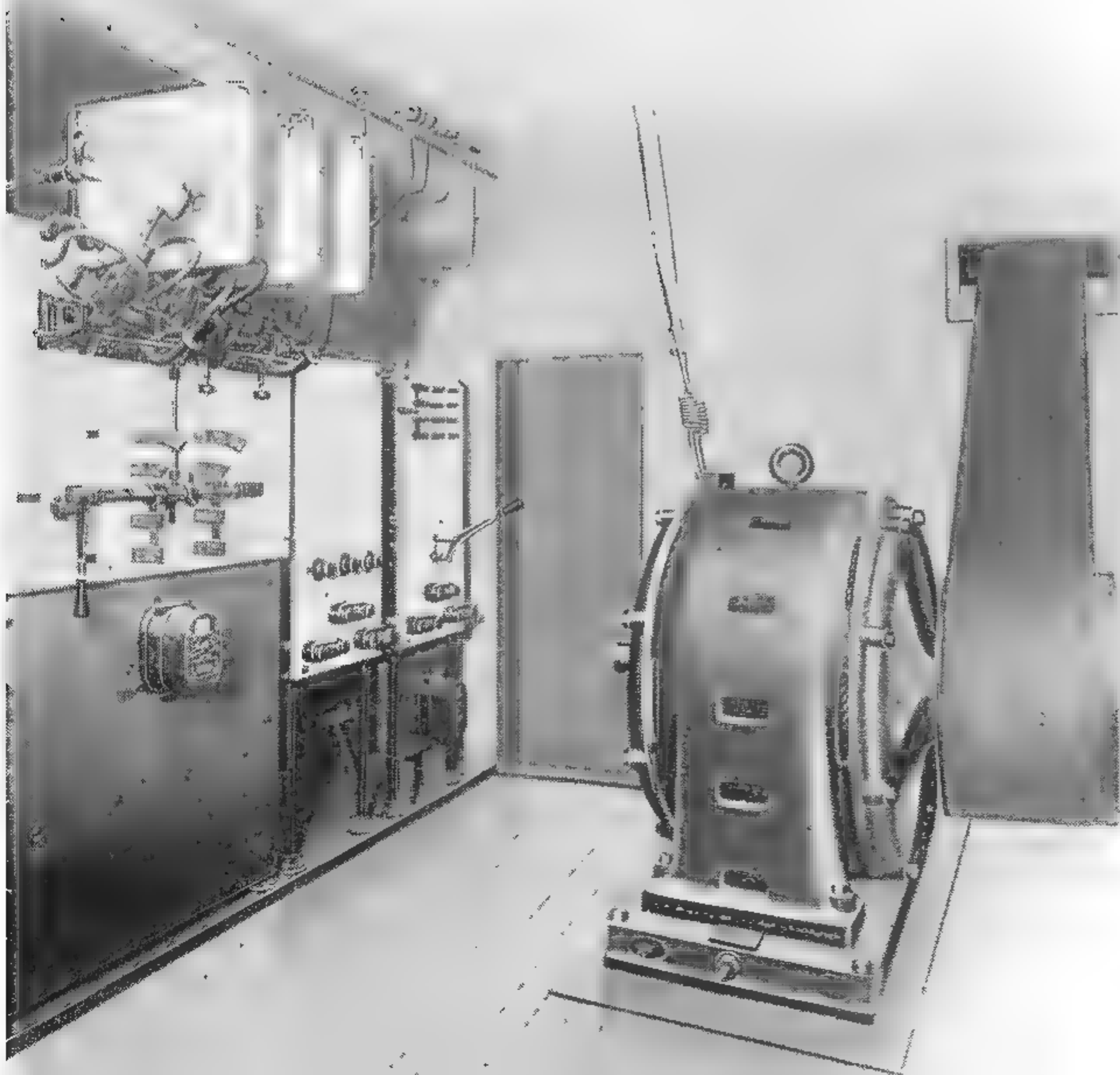
*The
Schoellkopf
Tannery*



*The
Standard
Plaster
Company*

A comparatively new industry, known as The Standard Plaster Company, have installed two motors aggregating 300 H. P. This Company manufactures calcined plaster, obtaining the raw material near the city where they have acquired the rights covering a large deposit of gypsum. Their motors are used for grinding and conveying the material in the course of manufacture. Here, as in other cases mentioned, a large amount of heat is necessary in manufacturing, but notwithstanding this the Company had no hesitation in adopting Niagara Falls power for operating the machinery of the plant.

The motors are housed in a separate room about ten by twelve feet in dimension, and connect to shafts in the usual manner. The view below shows all but one motor. Some attendant starts the motors in the morning and shuts them down at evening. Meantime the door of the room is kept closed, and no one need go near. The time of the attendant is devoted to other work.





Similar in nature to the installation just mentioned, but on the opposite side of the City, is a plant known as the Crocker Fertilizer Works, a branch of the American Agricultural Chemical Company. A motor capacity of 300 H. P. divided into about fifteen units has been installed in this plant within the past year. Chiefly grinding machines are operated in the production of different grades of phosphates and fertilizers. The changes in the power equipment have enabled them to very greatly reduce the amount of floor space formerly taken up by a steam plant and its appliances. Every department is now independent and in itself operative despite any difficulties which may arise in any other part of the works. Few industries operate all departments all of the time, and where it is possible to close down departments or groups of machines, it is easily demonstrated that the installation of a number of motors accomplishes a much desired object. It not only decreases the actual cost of operation of a plant but at the same time enables a manufacturer to increase his production should it be desired to operate all departments continuously.

*The
American
Agricultural
Chemical
Company*



***Sidney
Shepard &
Company***

Sidney Shepard & Company of this City are manufacturers of all kinds of sheet metal goods, pressed or stamped into the desired shape. Their establishment is a large one for the purpose and until recently they operated two distinct and independent plants. They have contracted for Niagara Falls power whereby they expect to utilize about 200 H. P. divided into a number of motors suitably disposed throughout their premises. The installation is not yet completed, but when it is there is no question but that the equipment will bear out the experience enjoyed by others.

***The Iron
Elevator
and
Transfer
Company***

Among those who have contracted for Niagara Falls power, and which installations are in the course of erection as this book goes to press, is to be mentioned The Iron Elevator and Transfer Company who will employ 250 H. P. in the operation of a transfer elevator. This equipment will operate throughout the entire year and in many cases twenty-four hours per day.

***The
Great
Eastern
Elevator***

The Great Eastern Elevator is another installation similar to those mentioned on previous pages. Grain will be stored and handled from vessels to trains and *vice versa*, requiring in the work some 950 H. P. subdivided into about 20 units.



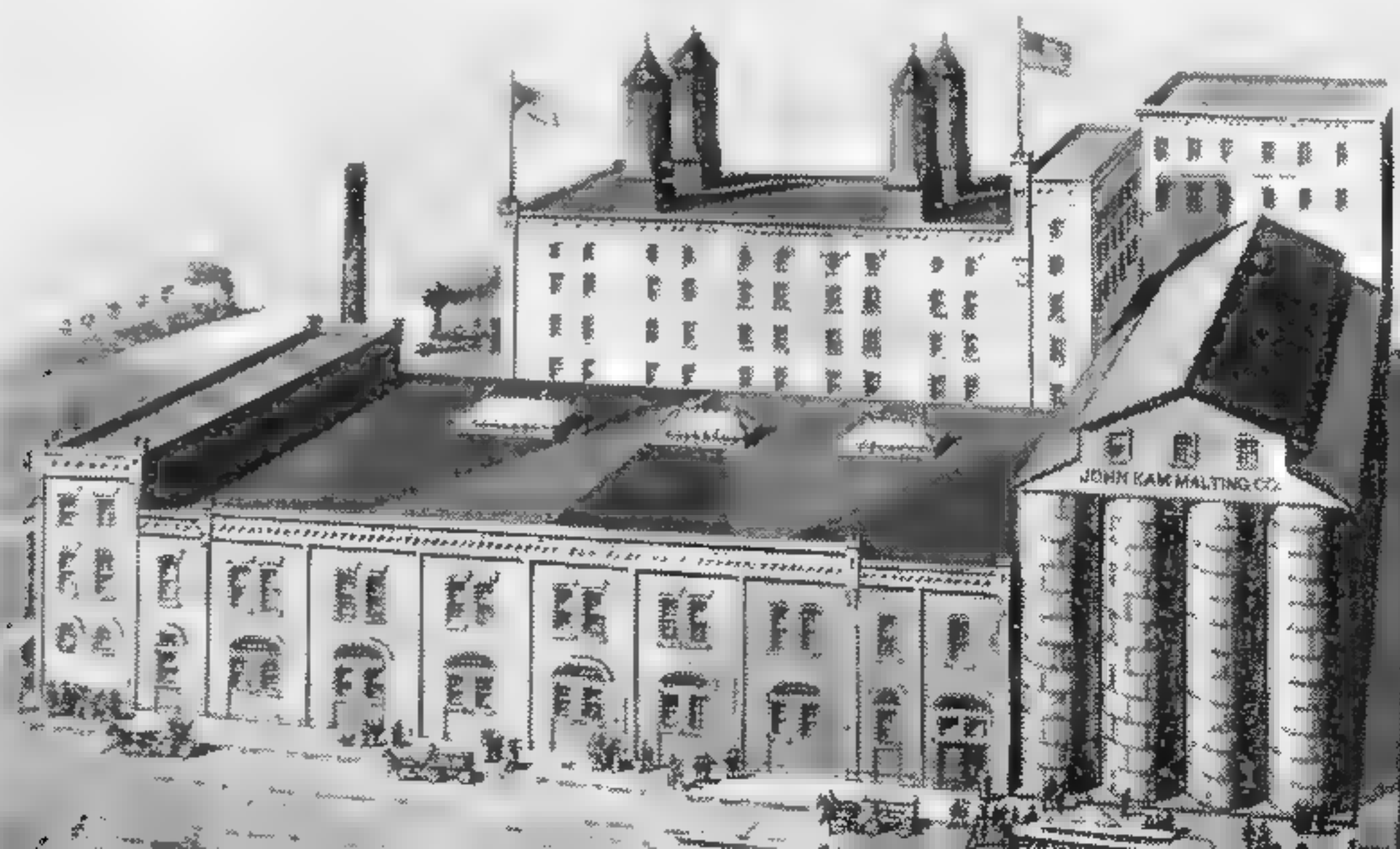
Across the street from the structure just mentioned there is being erected the new Dakota Elevator. There will be installed in this building some twenty motors aggregating about 925 H. P. in capacity. These will also perform the work of handling and conveying grain from vessel to train and from one part of the building to another.

The Dakota Elevator

The disposition of the electrical machinery in this plant resembles closely the other elevators mentioned herein. There is the usual switchboard controlling all of the motors from a common center. The installation is well divided, and the details of power appliances easily managed.

Before the close of the Exposition it is expected that the new malt house being erected by The John Kam Malting Company will be in operation. Some 400 H. P. will be utilized in this establishment for the production of malt. In this case and in the one previously mentioned it was readily demonstrated that notwithstanding the large amount of steam necessary in the production of malt, Niagara Falls power possessed so many advantages, both as regards cleanliness and economy, that it was adopted as the medium of motive power. Fifteen or more motors will do the work for the plant. Some of them will be controlled from one and the same point, while others will be independent.

The John Kam Malting Company



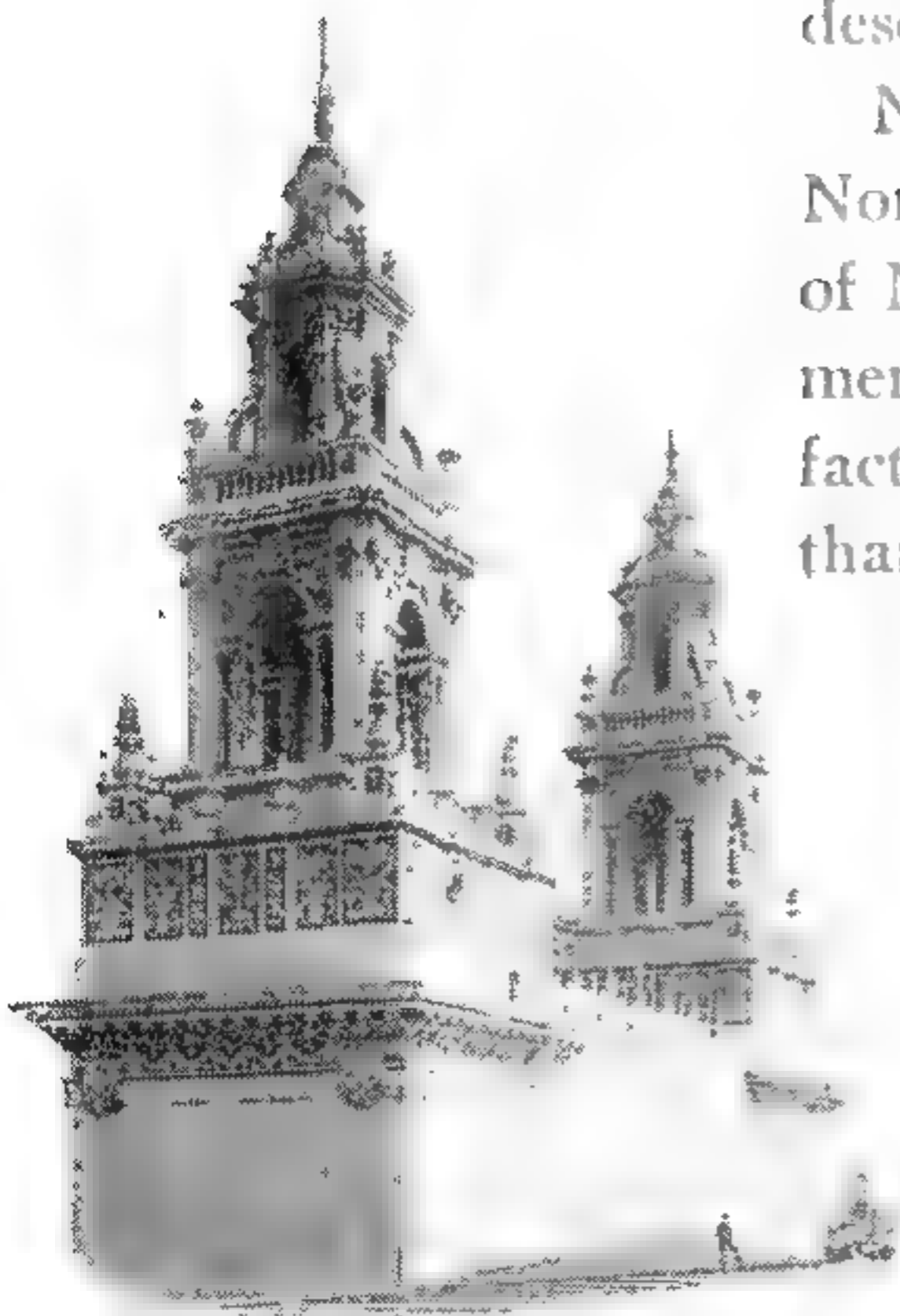
The Pan-American Exposition

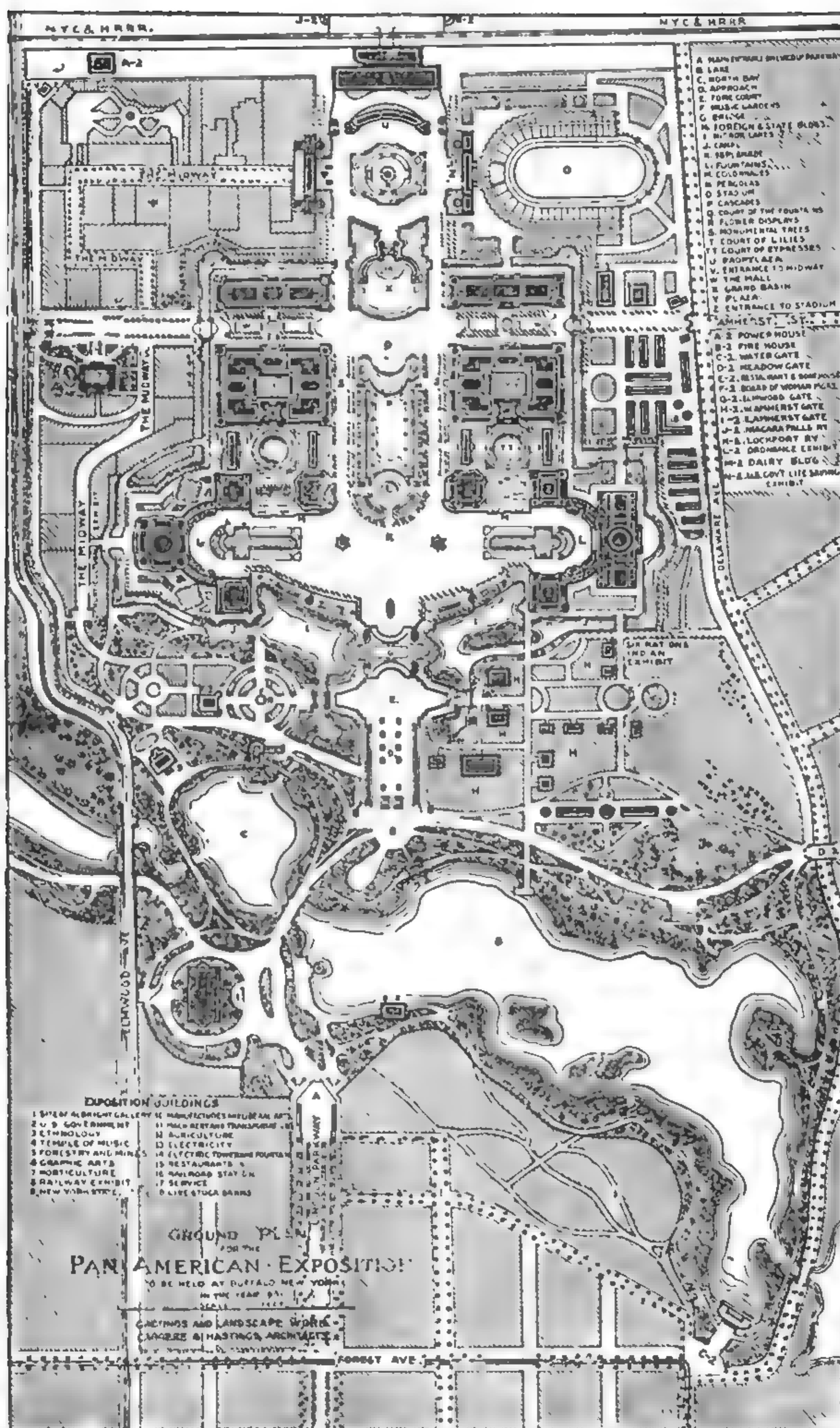
This pamphlet would be incomplete if some reference were not made to the electrical features of this great Exposition of the Pan-American countries.

Five thousand H. P. of electrical energy from The Niagara Falls Power Company is delivered upon the grounds by The Cataract Power & Conduit Company. Within the Electricity Building this power is sub-divided and transformed for use about the grounds in the decorative illumination, which has excited so much wonder and admiration. Every cornice, every spire and dome, every window, every roof line and entrance is outlined in a blaze of light coming from the Falls, twenty-one miles away.

The imposing Electric Tower rises at the head of the Grand Court, amid a nucleus of beautiful buildings. Upon its sides and topmost parts thousands of lights mark its graceful outlines and develop its exquisite coloring. Upon the buildings and within the grounds, three hundred thousand lights are controlled, as though but one from a single spot, so masterly and so adroitly, that standing upon the Bridge of Triumph, a faint pink glow is seen everywhere, which gradually shading through the red of sunset to a yellow bursts silently and majestically into the white light of day, leaving an impression upon the mind difficult to describe and never to be forgotten.

No such effect has ever before been attempted. None such has been possible until the vast resources of Niagara Falls gave us the great power development. Truly Nature's storehouse is man's benefactor, and no gift from it renders greater service than the waters of the earth.





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MANUFACTURERS CAN OBTAIN
Niagara Falls power for any purpose
and in any quantity in Niagara Falls, The
Tonawandas or Buffalo. The shipping
facilities of the Niagara Frontier are un-
surpassed. Factory sites are available
for any purpose. For specific informa-
tion, address as below, with statement of
maximum power desired, average power
and working hours per month.

The Niagara Falls Power Company
Niagara Falls, N. Y.

The Tonawanda Power Company
40 Court Street, Buffalo, N. Y.

**The Cataract Power & Conduit
Company**
40 Court Street, Buffalo, N. Y.

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